

Scientific Publication No. 549

HEALTH CONDITIONS IN THE AMERICAS



VOLUME II

1994 Edition

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PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION
525 Twenty-third Street, N.W.
Washington, D.C. 20037, U.S.A.

1994

Also published in Spanish (1994) with the title:
Las condiciones de salud en las Américas, Edición de 1994
Publicación Científica de la OPS No. 549
ISBN 92 75 31549 3

PAHO Library Cataloguing in Publication Data

Pan American Health Organization
Health Conditions in the Americas.
Washington, D.C. : PAHO, ©1994 — 2v.
(Scientific Publication ; 549)

ISBN 92 75 11549 4

I. Title II. (Series) 1. HEALTH STATUS
2. HEALTH STATUS INDICATORS 3. AMERICA
NLM WB141.4

ISBN 92 75 11549 4

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EXPLANATION OF SYMBOLS IN TABLES

| | |
|-----|---|
| .. | Not applicable |
| ... | Data not available |
| - | Magnitude zero |
| 0.0 | Magnitude greater than zero but less than 0.05 |
| * | Provisional data |

PREFACE

The 1994 edition of *Health Conditions in the Americas* is the eleventh in a series of quadrennial reports published since 1954 to document the changes and advances in health achieved by the Member and Participating Governments of the Pan American Health Organization. This document informs the XXIV Pan American Sanitary Conference about the health status of the peoples in the Region, as perceived by the Organization's Secretariat. It does not include a review of the technical cooperation activities between PAHO and the Governments, which are described for the Conference in the *Quadrennial Report of the Director 1990-1993, Annual Report 1993*.

The epidemiologic situation in the Region has undergone major changes in recent decades as a result of a complex set of processes that have altered the age structure of the population, the rate and extent of urbanization, the labor market, educational levels, the ecological situation, and the organization of health services. More than any other factor, however, the situation is influenced by the existence of deep social inequities and the growth of the population living in poverty.

The 1994 edition describes the changes that have occurred, emphasizing the period 1989–1992, to the extent allowed by the available information. It consists of two volumes. The first presents a profile of the health situation in the Region as a whole, in six chapters plus an annex of health and development indicators. The first two chapters depict the health situation and living conditions, as well as demographic characteristics, and provide an overview of mortality. The third and fourth chapters describe the health situation from two perspectives: by analyzing the health of different population groups and by reporting the status of specific diseases and health impairments. The fifth discusses the health impacts of environmental problems, including lack of basic sanitation, atmospheric pollution, chemical pollution, and disasters. The sixth chapter is an account of the responses societies have made to health problems; it incorporates information on the economic, political, and social settings in which they have taken place, current levels and trends in health expenditures and investments, the training of human resources and the health labor market, and changes that have come about in the organization and operation of health services. The annex is a compilation of the latest available figures on 54 health, economic, and social indicators for each of the countries. The second volume is made up of country reports that summarize the salient processes and problems in each country. The structure of the reports is similar to that of the first volume, but more specific detail is given.

This edition is based on information from many official and semiofficial sources. Despite efforts to do so, it has not been possible to eliminate every discrepancy among them.

Like earlier editions, this one responds to the needs and interests of a wide range of users. For governments, it will be a source of reliable data on leading health trends in the Region and countries. For national and international agencies, as well as students, researchers, and workers in the health field, it will be a useful reference for consultation. We are convinced of the relevance of this information, and we trust it will assist in decision-making and stimulate continued improvement of the generation, processing, and analysis of increasingly relevant and timely data for the framing of health policies, the reorganization of services, the prevention and control of diseases, and attention to priority problems.

Carlyle Guerra de Macedo
Director

ANGUILLA

GENERAL HEALTH SITUATION AND TRENDS

Anguilla extends for 90.6 km² and has a population of 8,960 (as of April 1991); it is the northernmost of the Leeward Islands, due east of Puerto Rico. It is a British Dependent Territory with internal self-government. The Government's Executive Branch is comprised of a Chief Minister, other ministers, and the Governor, who represents the United Kingdom; the Administration reports to the House of Assembly, the legislative body.

The economy is based primarily on tourism, offshore banking, and commerce. The construction industry is expanding, particularly in relation to tourism development. The principal sources of Government revenue are indirect taxation and user fees from residents and visitors. Rapid economic growth has resulted in a per capita GDP of US\$ 5,926 in 1992, compared to US\$ 1,720 in 1984 and US\$ 2,470 in 1987.

Health and Living Conditions

Most Anguillans own their own homes and land, and 95% of the territory is privately owned. Most people have access to electricity and telephone services. The overall quality of housing is considered to be within acceptable sanitary standards, with good ventilation and natural lighting; 6,241 persons in the population live in households with radios and 4,329 with televisions. Average occupancy is four persons per household. The unemployment rate in 1990 was 1%.

Population

In April 1991, a population and household census showed that the population increased from 6,680 in 1984 to 8,960 with women surpassing men in the total population only by 14; this increase surpassed projected annual growth rates. The long-term emigration trend of adult Anguillans in search of employment abroad has been supplanted by the importation of labor in recent years.

The population under 15 years of age declined from 35% in 1984 to 30% in 1991. Males outnumbered females by about 10% in the age group 25–29 years old (470 versus 427) and in the age group 40–44 years old (234 versus 215); in the age group 45–49 years old, the number of males was 15% higher than the number of females (169 versus 147). In the age group 75 years old and older, the number of women (216) was 44% higher than the number of men (150). Table 1 shows the distribution of the population by age and sex in 1991.

The birth rate was 24.5 per 1,000 population in 1991, and ranged from 26.3 to 18.8 in 1987–1990. Fertility rates per 1,000 women 15–44 years old declined from 131.4 in 1987 to 63.9 in 1992. Between 1987 and 1991 the number of births to teenage mothers as a percentage of total births was 18%.

The crude death rate was fairly stable: 8.4 per 1,000 population in 1989 (59 deaths) and 8.3 in 1991 (63 deaths). In 1991, the life expectancy at birth was estimated to be 73 years for females and 71 for males.

All deaths occurring in the hospital are certified by a medical practitioner and recorded by the Registrar of Births and Deaths. Deaths occurring at home also are certified by a medical practitioner and recorded by the Registrar of Births and Deaths. There is no evidence of underreporting.

Mortality

Because of the population's small size, the infant mortality rate per 1,000 live births fluctuated greatly from year to year, from 38 in 1988 to 5 in 1989, then to 13 in 1990 and to 35 in 1991. Over the period between 1989 and 1991, the rate was 18. During 1985–1987 a total of 13 infant deaths put the infant mortality rate for the period at 25 per 1,000 live births.

Practically all deliveries in the territory occur in the hospital, but an unknown number of women leave the island to give birth. During 1987–1991, 859 deliveries were registered in the hospital. In this period, there were 13 stillbirths, resulting in a stillbirth rate of 15 per 1,000 deliveries. The perinatal mortality rate for 1987–1991 was 14.8 and the neonatal mortality rate was 21.5 per 1,000 live births. Almost all infant deaths

TABLE 1
Population by age group and sex, Anguilla, April 1991.

| Age group | Total | | Male | | Female | |
|-------------|-------|-------|-------|------|--------|------|
| | No. | % | No. | % | No. | % |
| All ages | 8,960 | 100.0 | 4,473 | 49.9 | 4,487 | 50.1 |
| 0-4 | 986 | 11.0 | 494 | 5.5 | 492 | 5.5 |
| 5-14 | 1,749 | 19.5 | 867 | 9.7 | 882 | 9.8 |
| 15-24 | 1,558 | 17.4 | 796 | 8.9 | 762 | 8.5 |
| 25-34 | 1,668 | 18.6 | 848 | 9.5 | 820 | 9.2 |
| 35-44 | 1,098 | 12.3 | 560 | 6.3 | 538 | 6.0 |
| 45-54 | 610 | 6.8 | 317 | 3.5 | 293 | 3.3 |
| 55-64 | 480 | 5.4 | 229 | 2.6 | 251 | 2.8 |
| 65 and over | 811 | 9.0 | 362 | 4.0 | 449 | 5.0 |

Source: Population and Household Census 1991. Ministry of Finance and Economic Development, Anguilla, 1992.

occurred during the neonatal period. The causes of death were listed as prematurity and congenital anomalies.

According to the hospital's medical records, the number of deaths occurring in children 1-4 years between 1988-1992 was 3.

Diseases of the circulatory system (ICD-9, 390-459) are the leading group of causes of death for all ages combined, representing the assigned cause in 37% (118 deaths out of 316 deaths from all causes) of the total number of deaths (including those in the category for symptoms, signs, and ill-defined causes) in the 1987-1991 period. The corresponding figure for 3 available data years in the 1970s (1973, 1975, and 1976) was similar (35%, or 57 deaths out of 162 from all causes).

Of the 118 deaths assigned to diseases of the circulatory system during 1987-1991, 45 (38%) were due to diseases of pulmonary circulation and other forms of heart disease (415-429), while 39 (33%) deaths were due to cerebrovascular disease (430-438). Hypertensive disease (401-405) and ischemic heart disease (410-414) accounted for 31 deaths, or 26%.

The five leading groups of causes of death in 1987-1991, in rank order, were cardiovascular disease, with 76 deaths (24.1% of total mortality, including deaths from ill-defined causes); cerebrovascular disease, with 39 deaths (12.3% of the total); pneumonia, with 37 deaths (11.7% of total); malignant neoplasms, with 32 deaths (10.1% of total); and accidents and violence, with 28 deaths (8.9% of total). Together, the top five groups of causes covered 66.4% of total mortality (including deaths from ill-defined causes) in the 1987-1991 period.

It should be noted that most of the 37 pneumonia deaths were reported in 1987 (17) and in 1988 (15).

Deaths from external causes showed a downward trend in the 1987-1991 period; the number of deaths from this cause group for the consecutive 5 years were 12, 6, 6, 2, and 2.

No maternal deaths were reported during 1985-1991; 30% of all deaths occurred in persons 80 years or older.

Morbidity

The territory's mortality and morbidity rates fluctuate widely from year to year—on the one hand, the small denominators are uncertain because of immigration and emigration; on the other, the numerators also are uncertain because many Anguillians travel to Saint Martin, the United States Virgin Islands, and Puerto Rico for medical care or for HIV-testing, and to regional institutions or to the United Kingdom for tertiary-level care. Moreover, many pregnant women leave the island to give birth, and severely disturbed psychiatric patients are referred to Antigua.

According to hospital records, the most common causes of admission in 1991 were as follows: among patients aged 0-14 years old, conditions originating in the perinatal period, acute respiratory tract infections, gastroenteritis, and injuries; among patients aged 15-44 years old, injuries, urinary tract infections, alcoholism, and mental disorders; and among patients 45 years old and over, diabetes mellitus, hypertension, and cerebrovascular disease.

A 1989 health and population sector review conducted by Keele University found that alcohol abuse was responsible for the largest number of admissions other than obstetric causes in 1987, and in 1988 accounted for 5% of total hospital admissions. Admissions for mental disorders, particularly schizophrenia, make up 4% of admissions annually.

The main causes of attendance at district health clinics were respiratory tract infections, asthma, gastroenteritis, diabetes mellitus, and hypertension.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

Conditions originating in the perinatal period are the leading cause of perinatal and neonatal mortality.

The incidence of low birthweight infants as a percentage of live births has remained fairly constant; it

was 6.9% in 1991, compared to 7.5% and 6.9% in 1990 and 1989, respectively.

In 1992, 238 cases of respiratory tract infection were treated among children under 5 years old attending district medical clinics; 750 children under 5 years old were registered at these clinics in 1992. That year, only 12 cases of gastroenteritis were treated in this age group. Respiratory tract infection was the leading cause of hospital admissions.

Although there were some cases of gastroenteritis, this is not considered a serious problem. There are protocols for the management of diarrheal diseases, particularly oral rehydration. District nurses guide and counsel parents regarding the management of diarrheal diseases and respiratory tract infections, and make appropriate referrals for treatment.

In the 1990–1992 period, immunization coverage was 100% for BCG, polio, and MMR in children under 1 year old. In 1978–1991, no cases of diphtheria were reported. The last major measles epidemic occurred in 1979, when 259 cases were reported. There were no cases from 1983 through 1987, but there were 2 cases of measles reported in 1988, 7 in 1989, 15 in 1990, and 1 in 1991.

In 1981, one case of tetanus was reported; since then, no cases were reported up to 1991. The ages of the patients were not included in the reports. Coverage with tetanus toxoid is 100% for prenatal women.

Adolescent and Adult Health

No services specifically target adolescents, and data on the health status of this age group are limited. For the last 5 years, live births to mothers aged 15–19 years old averaged 18% of total live births. Family planning services are available to adolescents, and primary and secondary schools offer a program of family life education that includes peer counseling and skills training.

Diabetes and hypertension are the main health problems among adults, and are highest in the age group 45 years old and older. Of the number of persons admitted to hospital for hypertension and diabetes in 1988, 100% and 78%, respectively, were over 45 years old. The same pattern was seen in 1992 for those persons with diabetes and hypertension who visited health centers—82.5% of those with hypertension and 85.0% of those with diabetes were 45 years old and over.

Apart from parturition, visits to outpatient obstetric clinics are mainly for urinary tract infection, candidiasis, and bleeding disorders associated with hormone imbalance and uterine fibroids. Of 200 Pap smears

taken in health centers in 1989, two cases of cervical carcinoma were detected.

Health of the Elderly

The main causes of mortality and chronic ill health in this age group are cardiovascular and cerebrovascular diseases and malignant neoplasms.

Social changes have affected the traditional pattern of family care for the elderly, who comprise 9.1% of the population. Public health nurses periodically visit approximately 120 elderly persons who are considered “shut-ins.” The infirmary adjacent to Cottage Hospital is supervised by the hospital’s staff and accommodates 10 elderly persons; medical visits are usually made weekly. Other problems affecting the care of this group include social isolation, lack of occupational and recreational services, and blindness.

Diseases and Health Impairments

Dengue is endemic in the Caribbean, and the *Aedes aegypti* mosquito vector of dengue and yellow fever, is prevalent in the island.

One case of *leprosy* was diagnosed in 1985. The few contacts completed their course of prophylactic treatment, and the primary case has since died.

One case of *tuberculosis* was reported in 1985. Six persons are registered as former tuberculosis patients.

Regarding *oral health*, a 1986 baseline survey found that the DMF (decayed, missing, and filled teeth) index among 12-year-olds was 8.6, while a survey of 15–19-year-olds revealed that 34% had periodontal disease. There is an ongoing program of prophylactic care that includes providing fluoridation for schoolchildren 3–11 years old.

The prevalence of *HIV infection* is not known, since persons from Anguilla go to Saint Martin and other neighboring countries to be tested. As of September 1992, the cumulative total number of persons reported infected with AIDS was four; three of these have died.

Risk Factors

Concern has been expressed about possible ground-water pollution in the Town as a result of inadequate septic-tank systems. Other pollution threats involve ocean dumping of sewage and seepage of effluent from pit latrines. Food sanitation is another area of concern, because there is no abattoir, and slaughtering of ani-

mals takes place on private premises. Food inspectors are not always informed of such activity as required.

Anguilla lies in the tropical storm belt and is at risk from hurricanes. There is a national emergency organization that coordinates prevention, mitigation, and response and recovery activities. Draft operational plans have been developed for the hospital and community health services to respond in the event of a disaster. Training of key personnel also has been accomplished.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

The 1989 budget speech to the fourth House of Assembly stated the goal to "achieve primary health care for all Anguillans by the year 2000." At that time, the Government expressed its intention to develop a 5-year strategic health plan, addressing health infrastructure, manpower and training, AIDS control, health legislation, environmental health, geriatrics, pharmacy services, dental care, private practice, and laboratory services.

That same year, a health and population sector review was conducted by the Keele University Center for Health Planning and Management. The Government of Anguilla is collaborating with the United Kingdom's Overseas Development Administration in a 3-year adjustment program for the health sector that includes financial restructuring. The primary objective is to strengthen the capacity of the health sector in "planning and management of activities so that public aspirations for good quality care could be met in an affordable and sustainable manner."

Organization of Services

Personal Health Care Services

The Ministry of Health is responsible for the management of all health services. The Permanent Secretary is responsible for the overall administration, and responsibility is delegated to technical and administrative staff within the Ministry, the Hospital, and the health centers.

Infrastructure. The infrastructure for personal health care services consists of five district health centers/clinics; Cottage Hospital, with 24 beds; a dental

unit; a 10-bed infirmary for geriatric care; and private doctors' offices.

Functionally, the health services are divided into district and hospital services, and operate as a two-tier system. At the district or local level there are five district health clinics—in the Valley area (population 4,004), in South Hill (population 2,561), in West End (population 611), in East End (population 1,036), and in Island Harbour (population 748). Services at the district clinics include maternal and child health, family planning, environmental sanitation, home visits, and diabetes and hypertension clinics. Private physicians also provide care at this level. There are referral linkages from the local level to the hospital.

Secondary care is provided at the 24-bed Cottage Hospital which is only a 10-minute drive from the farthest district; it provides inpatient obstetric, gynecological, pediatric, medical, and surgical services, as well as outpatient and emergency care. Support services include a pharmacy, laboratory, and X-ray department. Clients seen at the health centers could be referred by a nurse or doctor, and private doctors also refer patients to the hospital. The new Princess Alexandria Hospital will have 36 beds.

There is no systematic mechanism for referring patients discharged from the hospital to personnel at district health clinics for care.

The dental unit is located in the Valley, and serves the whole island. It is staffed by a dental surgeon, three dental auxiliaries, and two dental care assistants; a consultant orthodontist visits monthly.

The island has no facilities for tertiary-level care. Clients who need specialized service are referred to regional health institutions in the Caribbean, including Puerto Rico, and in the United Kingdom; 18 patients were referred in 1991 and 38 were referred in 1992.

Coverage. Free prenatal and postnatal health services are provided to women and children. Persons with hypertension or diabetes and the elderly who qualify also are entitled to free-of-charge care. Most older persons receive some financial support from the Government in the form of a monthly allowance, which is arrived at through a means test. Each health clinic is staffed by a district nurse and a clinic aide. The Valley Health Center has two nurses and a community health aide. Environmental health officers routinely visit areas as assigned. Medical officers conduct medical clinics twice weekly at four health clinics and once weekly at one health clinic. The Valley Health Center, which served a population of 2,930 in 1988, now serves a population of 4,004.

Prenatal care is offered at health clinics on a weekly basis and at Cottage Hospital, where high risk pregnant women are seen. Pregnant women are encouraged to attend clinic by the 12th or at least the 16th week of pregnancy. There are written standards, norms, and procedures for the management of the pregnant woman. There are criteria for determining "high risk" status, whose primary objective is the early detection of abnormalities and the prevention of complications arising from pregnancy, particularly pre-eclamptic toxemia and eclampsia. There are guidelines for the management of high risk pregnancies.

Prenatal coverage of pregnant women is 97%; of 167 women who delivered in hospital in 1991, 162 attended health centers. The trend of women going off the island to have their babies is waning, particularly since the island now has an obstetrician employed by the Government. In 1991, 42 pregnant women in their first trimester (22%), attended clinic. The average number of visits for each mother up to the 36th week of pregnancy was four. The number of antenatal women registered for prenatal care at all clinics was 230, and the number of attendances up to the 36th week was 622 in 1992.

All mothers are referred to the hospital for delivery. Hospital stay for primigravidae is 5 days; for normal deliveries it is 3 days. In 1991, 23 of 168 deliveries (14%) were by cesarean section. Two nurses have been trained in neonatal care, but there are no intensive-care neonatal facilities for prolonged resuscitation in the hospital. All mothers are referred to their respective district clinics for follow-up care, and they are given appointments to return in 6 weeks to the postnatal clinic in the Valley, where they are seen and examined by the gynecologist.

District nurses visit mothers discharged from hospital at home to provide follow-up care to mother and infant. Infants attend clinics at 6 weeks, at which time physical, developmental, and nutritional assessments are performed and immunizations are initiated according to schedule. Currently, 188 infants are registered at five clinics.

Family planning services and counseling are provided at all health centers/clinics, and family life education activities are an integral part of the program. Women attending this service receive medical examinations and have Pap smears taken.

The total number of persons participating in family planning services increased by almost 100%, from 605 in 1990 to 1,185 in 1991. New users accounted for 8.3% of total users, and 70 clients discontinued participation in the program.

Clinics for preschoolers are generally well attended. An average of 32 attend each clinic session. There is no organized school health program. Some screening of schoolchildren is done by nurses at district health centers, booster doses of immunization are administered, and referrals are made when necessary. This does not include screening for visual acuity or hearing defects.

Medical clinics are held at Valley, East End, South Hill, and West End twice weekly, and once weekly at Island Harbour. In 1992, 7,070 clients were seen at 415 sessions conducted by medical officers at five health center clinics. The average number of persons seen at the five clinics is 17 per session, ranging from 35 at Valley Health Center to 7 at West End.

District nurses conduct home visits for follow-up care and/or supervision related to medication, treatment, and advice; epidemiologic surveillance; encouraging attendance at clinics; checking up on persons who have missed appointments; providing nursing care; and giving prenatal guidance and counseling. A total of 1,175 home visits were made in 1992, as compared to 1,358 in 1991. Of the total in 1992, 345 (29.4%) were visits to elderly "shut-ins" and 25 (2.1%) were prenatal visits. The ratio of district population to number of home visits shows that the smaller populations get relatively more home visits. The ratio varied from 4:1 in the small communities of West End and Island Harbour (populations 611 and 748, respectively) to 9:1 in the Valley (population 4,004) and 13:1 in South Hill (population 2,561). The ratio was 5:1 in East End (population 1,036).

The dental unit in the Valley is staffed by a dental surgeon, three dental auxiliaries, and two dental assistants. There is an ongoing prophylactic service for schoolchildren, including fluoridation.

The average annual number of attendances seen and treated by the dental surgeon is 2,434 and by the dental auxiliaries, 2,412. Of 4,980 attendances in 1991, 37% resulted in tooth extractions and 32% in fillings. Over the 1987-1991 period, a total of 21,543 attendances resulted in 7,809 tooth extractions (36%) and 9,028 fillings (42%).

There is a national program for the prevention and control of AIDS. Community awareness and education activities with schools, youths, and other groups are a key component of this program, which integrates information on sexuality, body changes, and substance abuse. Data on the incidence of sexually transmitted diseases are limited or nonexistent; this lack may be attributed to the fact that some clients seek medical consultation outside of Anguilla, as well as to the non-reporting of these conditions by private physicians.

A community mental health program was started in 1990 with the appointment of a community psychiatric nurse who is assisted by district nurses in the follow-up care of clients; 56 clients currently receive community care. A part-time resident clinical psychologist is available for consultation, and a consultant psychiatrist periodically reassesses patients and advises on further management. In 1992, 52 severely disturbed patients were referred for consultation.

Acutely ill clients are supervised by a medical officer and referred to a psychiatrist who visits the island quarterly. Severely disturbed patients are sent to either Antigua or Barbados for hospitalization and treatment.

The following summarizes several performance indicators for Cottage Hospital for 1991: bed occupancy rate, 44%; average length of stay, 3.1 days; number of inpatient admissions, 1,036; number of discharges, 1,052; number of attendances at the casualty/outpatient clinic, 2,480; obstetric bed occupancy rate, 33%; number of surgical operations, 259.

Outpatient, weekly clinics provide surgical, antenatal, diabetic, and hypertension care. Attendance at diabetic and hypertension clinics averages 12 weekly; attendance at surgical clinics for 1991 was 537.

The laboratory functions as a diagnostic facility for the hospital, health center/clinics, and the private sector, performing tests that include hematology, microbiology, clinical chemistry, and serology (including HIV analysis). Specimens for cytology and histology are sent to Antigua for analysis. Blood banks have limitations—inadequate storage facilities and the small size of the population makes blood unavailable sometimes.

The X-ray unit is managed by a radiographer and two technicians; limited accommodations and equipment affect the unit's ability to carry out its workload. In 1992, 910 examinations and 29 special investigations were carried out; 259 electrocardiograms were performed, representing 52% more than the previous year.

The pharmacy is staffed by a senior pharmacist and two pharmacists. It is located at Cottage Hospital and provides pharmaceuticals to the hospital and clinics. Storage facilities are inadequate. Drugs are procured from suppliers in the United Kingdom, Barbados, and Canada. A pharmacist frequently accompanies doctors on ward rounds and sometimes on their clinic visits.

Government service has to compete with the private construction and hotel sector for scarce maintenance staff. Often there are long delays for maintenance and repair work requested at health facilities. The repair of biomedical equipment is a long-standing problem. Laboratory and X-ray equipment often lies inopera-

tive, waiting for a technician to travel from Puerto Rico or the Virgin Islands to repair it, or while the piece of equipment is sent abroad.

Environmental Services

The Environmental Health Department handles solid waste management, food hygiene, insect vector and pest control, liquid waste management, environmental sanitation, beach and roadside cleaning, building hygiene, occupational health and safety, and the provision of low-cost sanitation services.

The rapid growth of the tourist and construction industries have increased solid waste, most of which is nonbiodegradable. The estimated daily volume of waste collected is approximately 12 tons. The dumpsite at Corito Bay, an area of approximately 20 acres, is being used for the disposal of solid waste and is eventually to be transformed into a sanitary landfill. In order to utilize this dumpsite to its utmost, trenches being dug in already excavated areas are filled with solid waste, thus using the same space twice.

The Anguilla Water Authority is responsible for the planning, construction, operation, and maintenance of the water supply works. This authority also is responsible for monitoring the water quality, but this has not been strictly or continuously implemented. The Health Department does not carry out water quality surveillance; although a laboratory in this department has been equipped to monitor the bacteriology of the water supply, it has not been staffed.

Building regulations require that new houses be built with cisterns. Public water supplies are obtainable from groundwater sources, and eight new wells in the Valley and four in the Quarter/Stoney Ground area now produce an additional 303,000 gallons per day. Private supplies are obtained from rainwater storage in cisterns, and some hotels use desalinated water (reverse osmosis plants); 56.6% of households have rainwater cisterns, 33.4% have piped water, and 10% use public standpipes.

There is no sewerage system in Anguilla. Human waste is disposed of through septic tanks (80.6% of households) and pit latrines (13.4% of households); 6% of households are reported to have no facilities. Some hotels use packaged sewage treatment plants.

Environmental conditions in schools, hospitals, health centers, and other institutions are monitored. There is notable absence of potable water supply in schools and a heavy reliance on stored water in cis-

terns. There is periodic spraying of school compounds to control mosquito breeding places.

The 1978 Food Hygiene Regulation empowers the Health Department to carry out periodic inspections of premises where food, drink, and other commodities are sold. Food handlers are required to have physical examinations, VDRL tests, and tests for ova and parasites. This program involves the examination, certification, and registration of all food handlers and food premises. Food handlers undergo another medical examination in the 3rd year. Education of food handlers has been heightened, particularly since the Region's cholera alert. In 1992, 200 food premises were inspected and 355 food handlers examined.

There is a nationwide program for the control of *Aedes aegypti*. In the past, activities consisted mainly of stocking cisterns with larvae-eating fish and handling complaints of mosquito nuisance. During 1991, a project to develop a community-based approach to the control of *Aedes aegypti* was initiated, involving an integrated strategy based on stocking cisterns and other rainwater storage areas with larvae-eating fish, as well as house inspections and treatment. The household infestation index was 66.7 in 1989 and declined to 25.0 in 1992. In 1992, 2,230 premises were inspected and 1,209 were treated. Seventy-one houses were sprayed.

Rodent control is ongoing, particularly during the inspection of food premises. Baiting operations also are continuous at public institutions as a means of control. Rodenticides are sold to the public.

Beach cleaning is routinely done as a means of maintaining the aesthetic quality of the surroundings and as a way of protecting the coastal environment.

A senior health education officer and a health education officer are responsible for coordinating health promotion activities. Health education programs are being reoriented to focus on the promotion of health and wellness, emphasizing behavior modification and lifestyle changes. Target groups are schoolchildren and their parents, young adults, and other community groups. Mechanisms for intersectoral collaboration and community participation in all activities are being strengthened. Radio and television are used to disseminate information.

Available Resources

Human Resources

There are no educational and/or training institutions for health personnel in Anguilla. Depending on the training need, health personnel are sent to various islands in the Caribbean, the United States, and the United Kingdom. Health personnel participate in ad hoc in-service education programs.

As of March 1993, the following human resources were available: 10 physicians (including 4 in the private sector), 3 pharmacists (including 1 in the private sector), 22 hospital nursing personnel (13 registered nurses and 9 nursing assistants), 17 community health nurses (7 registered nurses, 5 clinic aides, 5 care assistants), 1 laboratory technologist, 1 radiographer, 4 environmental health officers, 1 dental surgeon, 5 dental auxiliaries and assistants, 3 health educators, and 23 persons working in administrative, maintenance, and support services. Some government medical officers are allowed to pursue private practice.

Financial Resources

The health sector budget comprises allocations for hospitals and community services, sanitation, and dental services.

Aid support from the United Kingdom for recurring budget health expenditures ceased in 1985, and, since that time, Anguilla has been self-sufficient in meeting the recurrent costs of health services expenditures. A portion of health expenditure is met through cost-recovery mechanisms.

Revenue sources from the health sector to recover costs are medical and dental fees, laboratory and X-ray fees, and sales of pharmaceuticals. It is estimated that 7% of the health sector's recurrent expenditure is met by revenue collected.

In 1988, the health sector's recurrent expenditure as a percentage of total Government recurrent expenditure was 13.0%. In 1990, this figure was 11.4% and in 1993, it increased to 17.0%. This increase is expected to cover the operating cost of the new hospital.

ANTIGUA AND BARBUDA

GENERAL HEALTH SITUATION AND TRENDS

Antigua and Barbuda became independent in November 1981; it is governed by a democratic institution integrated by elected parliamentary representatives and constituted by a majority party and an opposition party. Elections are held at least every 5 years. Executive authority is vested in a cabinet that is headed by a Prime Minister and comprises 14 ministers. The Minister with responsibility for Health is also responsible for labor, the State Insurance Corporation, and the medical benefits scheme. Administratively, Antigua is divided into 16 constituencies, and Barbuda represents one.

The country, which also includes the uninhabited island of Redonda, is part of the Eastern Caribbean's Leeward Islands. Antigua's relatively flat topography is punctuated by southwestern volcanic hills and central plains, all of which strongly influence the island's hydrology. To the north and east, the soil is mainly calcareous limestone. Annual rainfall is low, averaging 40 inches, and droughts occur every 5 to 10 years. There are no rivers, very few streams, and much of the rainwater flows to the sea.

Health and Living Conditions

The country's economy depends primarily on tourism, with tourism and related services accounting for 60% of the GDP. The Government's strategy continues to focus on further developing the tourist industry and diversifying the economy by expanding commodity production, especially in livestock, food processing, and manufacturing.

Per capita GDP was US\$ 4,984 in 1990, compared to US\$ 3,400 in 1987. Annual average growth declined from 9.0% in 1988 to 2.8% in 1990. Currently, the external debt is in the vicinity of US\$ 270 million, an increase from US\$ 180.7 million in 1986, and efforts are underway to bring about a phased reduction of the overall public sector deficit to a level where it can be fi-

nanced over the medium term. Remittances from the United States Virgin Islands, the United States of America, and the United Kingdom continue to play a role in the maintenance of living standards.

The inflation rate in 1990 was 7.0%, down from 9.2% in 1987. Adult literacy is 90% and all eligible children 5-15 years old are enrolled in school. In 1991, 51.5% of persons under age 15 had secondary level education, as compared with 11.8% in 1960.

Population

The most recent national population census was conducted in mid-1991. According to preliminary figures, the total population of Antigua and Barbuda was 59,355; the breakdown by sex is 28,612 males and 30,743 females, for a male-to-female ratio of 1:1.07.

This total figure is significantly lower than the population estimates that had been given since the last official census in 1960, a difference that cannot be explained solely on the basis of migration. (In 1988, the estimated midyear population was 81,000). As a result, many of the health and socioeconomic indicators will have to be recalculated, and data that depend on demographic characteristics should be interpreted with extreme caution.

Persons under the age of 15 years make up 30.4% of the population, and the age group 65 years old and older constituted 8.2%. Life expectancy at birth is 74 years.

The number of registered live births has varied little over the past several years—it was 1,256 in 1992, compared with 1,178 in 1991, and 1,288 in 1990. The birth rate in 1989 was 14.5 per 1,000 population compared to 14.0 in 1987.

The population's ethnic breakdown is just over 90% of African origin, 3.7% mixed, and 2% white. There are small groups of Syrian, Lebanese, Chinese, East Indian, and Portuguese persons.

Over the years, Antigua and Barbuda has attracted migrants from many countries. According to the census, foreign-born residents primarily came from Dominica, Guyana, Montserrat, the Dominican Republic,

Jamaica, Saint Kitts and Nevis, Saint Vincent and the Grenadines, and Saint Lucia; the United States and the United Kingdom were the leading countries outside the Caribbean.

The education system is being expanded throughout, from the preschool level to the tertiary level of the State College, which offers a range of academic and technical courses. The local center of the University of the West Indies (an institution jointly operated by the English-speaking Caribbean Governments) provides continuing education through locally conducted courses and through the distance teaching system that links the University's centers in the different Caribbean locations.

Mortality

Mortality data are generated by death certificates completed by physicians. The death rate in 1990 was 6.3 per 1,000 population. The leading causes of death in Antigua were malignant neoplasms, heart disease, and cerebrovascular disease, with the ranking varying slightly from year to year. Diabetes and external causes also are important recorded causes.

The infant mortality rate remained constant at 21 per 1,000 live births in 1990, compared to 20.2 in 1989 and 20 in 1988. The neonatal mortality rate was 17.1 in 1990, compared to 18.4 in 1989. Of 26 deaths occurring in 1990, 22 occurred in the perinatal and neonatal periods, the most frequent cause of death being prematurity. There was one death due to neonatal tetanus. Data from Holberton Hospital indicate that of 1,158 births in 1992, 47 were premature and 17 were stillbirths. In 1990, there were 7 deaths occurring in children 1 to 4 years old.

Morbidity

In 1990, the leading cause of admission to Holberton Hospital for children under 1 year old was gastrointestinal infection and for those 1-4 years old, respiratory tract infections.

In 1992, the most reported communicable diseases were gastroenteritis (notifiable only for children under 5 years old), influenza, conjunctivitis, chickenpox, syphilis, other venereal diseases, and foodborne illness.

The leading conditions for which persons sought treatment in the community health centers were hypertension (31.1%), diabetes mellitus (9.9%), and acci-

dents and injuries (6.5%). Other common conditions recorded included arthritis, heart disease, acute respiratory infections, alcohol and drug abuse, gastroenteritis, bronchial asthma, mental illness, and sexually transmitted diseases.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

The majority of infant deaths occur in the perinatal and neonatal periods, with prematurity being the main cause of death. In 1990, 8.0% of infants had a birthweight of less than 2,500 g. Almost all deliveries are conducted in the Holberton Hospital, which has adequate facilities in the special care infant unit for premature and other infants requiring intensive care.

Of infants under 1 year old attending community clinics, 9.3% were classified as high risk; less than 1% of those 1-4 years old were so classified. Only 1% of children under 1 year old were considered underweight according to the Caribbean growth chart, while 8.8% were overweight. In the age group 1-4 years old, 1% was underweight and 2.8% overweight.

Common health problems among children 0-5 years old attending health clinics are acute respiratory infections, diarrhea, and skin infections.

Regular child-health sessions are held for developmental and other screening and for parental guidance and counseling on child care; 53% of infants attended clinic before the age of 6 weeks.

Schoolchildren are periodically screened for abnormalities by the family nurse practitioner. Dental disease is one of the most common conditions, identified in 11.8% of 5-year-olds and 9.0% of 10-year-olds. Helminthic infestation and visual defects also are common.

Births to women under 20 years old showed a decline to 19.1% in 1989, compared to 23% in 1987. The UNFPA-funded peer counseling and youth health services project, has made significant inroads in addressing the health care needs of adolescents; its components are peer counseling, family life education, adolescent mothers program, parent education program, and an adolescent health service, which is managed by a family nurse practitioner and a physician working part-time.

Most of the elderly's health problems are due to chronic noncommunicable diseases, and hypertension is frequent. Cerebrovascular disease, cardiovascular diseases, and malignant tumors are the main causes of

death and chronic ill health. Blindness and hemiplegia also are common causes of disability among the elderly. The program for the elderly is being reviewed, and a specialist is being recruited for the gerontology service.

The major causes of death in women in 1990 were cerebrovascular disease, malignant neoplasms, diseases of pulmonary circulation and "other" forms of heart disease, ischemic heart disease, hypertensive disease, other diseases of the respiratory system, and endocrine and metabolic diseases.

Clinic attendance by females is twice that of males. High levels of obesity are recorded for females 40 years old and older. The Women's Bureau in the Ministry of Education has conducted education programs for women on health-related issues.

All employed persons are required to be enrolled in the social security and medical benefits schemes. Benefits include grants for disability and retirement and provision of medication for certain diseases, including hypertension, diabetes, glaucoma, and mental illness.

There is a Council for the Handicapped that coordinates activities for the disabled. Special programs for the visually handicapped include general education and technical and craft training, which are organized by nongovernmental organizations and receive some support from Government.

Diseases and Health Impairments

There have been no recent outbreaks of vector-borne illnesses. However, *dengue* is endemic in the Caribbean and the *Aedes aegypti* mosquito vector of dengue and yellow fever is present in the island, threatening the country with disease outbreaks.

There is constant surveillance to prevent the importation of *malaria*.

Ciguatera poisoning occurs, and is associated with locally caught barracuda and other fish.

There are occasional cases of *tetanus*, the most recent having been recorded in 1993 in an adult with doubtful immunization history. There have been no cases of *diphtheria* or *pertussis* in recent years, and there were no confirmed cases of *measles* in 1992. No cases of *typhoid* fever have been reported for the past 10 years.

A special task force has been convened for the prevention of *cholera*, that includes representatives from the Ministry of Health, the Public Analyst Department, and other agencies; no cases have been identified in Antigua to date.

Since the identification of *AIDS* in Antigua in 1985, 77 persons tested positive to HIV infection up to the end of May 1993. Thirty-four cases of *AIDS* have been reported, including 5 children, and of the remaining adults, 22 were males and 7, females; of this number, 27 persons have died. Heterosexual spread is more prominent, and intravenous drug abuse is uncommon in Antigua. All blood donors are screened for HIV.

Regarding other sexually transmitted diseases, *gonorrhoea*, *syphilis*, and *nongonococcal urethritis* are the most common. Of particular concern is the recent recurrence of cases of congenital syphilis.

There are 15 patients with *leprosy* on the register, and two of them remain at the Leper Home for accommodation only. None of the cases was under treatment, five were under surveillance, and the others were under general care.

There are six cases of *tuberculosis*, the largest number in 5 years. Tuberculosis is under careful study, particularly since BCG vaccine is not included in the immunization program, and tuberculosis may again pose a problem with the advent of *AIDS*.

Behavioral disorders are a priority health program. A community mental health program provides follow-up care to clients discharged from the mental hospital. Cocaine, marijuana, and alcohol abuse are causes for concern; a rehabilitation program has been developed, and services are offered through the mental hospital and the community mental health program.

The *oral health* program has been beset by equipment maintenance and supply problems. A fluoride rinse program is carried out in public schools, and dental services are provided at the St. John's Health Center, which is staffed by two dentists, a dental nurse, a hygienist, and an assistant.

Zoonoses are not a problem. The veterinary authority and the Ministries of Health and of Agriculture are responsible for the inspection of local and imported meat and animal products. Training of public health inspectors is ongoing.

Traffic *accidents* take a heavy toll, and victims are sometimes hospitalized for long periods. *Violence* also accounts for much injury and sometimes death.

Risk Factors

Agricultural and waste disposal contamination threatens drinking water supplies—several biocides used in agriculture in Antigua and Barbuda are hazardous to human health and fertilizer contamination

has led to high nitrate levels that are extremely toxic to infants.

The proliferation of itinerant food vendors also is a matter for increasing concern. The health department has embarked on a program of ongoing education of staff in food establishments as well as persons operating independently.

The country lies in the tropical storm belt and is at risk from hurricanes; it is also at risk from earthquakes. There is a national emergency organization that coordinates disaster mitigation, prevention, preparedness, response, and recovery. There also is a health coordinator responsible for coordinating health sector activities as they relate to disaster management, and a health sector and hospital operational plans to respond in the event of a disaster. Training of key health personnel in disaster management has been accomplished.

SOCIAL RESPONSES TO HEALTH PROBLEMS

Policies

A health policy document approved by the Cabinet in 1984 outlines policy goals in relation to the following program areas: personal health services, environmental health, health infrastructure, and support staff. In the presentation of the 1989 budget, the Government reaffirmed its support of the primary health care strategy, while recognizing that: "(1) Care at the secondary level needs to be reorganized to support referrals and the interrelationship of the two systems. (2) Managerial restructuring is necessary to enhance efficiency and effectiveness of the health care system. (3) Review and evaluation of the financing mechanisms and in particular the Medical Benefits Scheme is required."

Even though there has been a decline in economic growth in recent years, the health sector continued to hold on to its position of high priority within the government. The organization of the Ministry of Health currently is under review, particularly in terms of restructuring the central board of health, strengthening the local district health system, improving the administrative expertise in institutions and departments, and expanding the epidemiology service.

The assessment of human resource needs for health is an ongoing undertaking. A training and fellowship committee has been constituted to facilitate rational manpower development.

More attention is being paid to cost recovery for services provided at the general hospital, and the general accounting systems also are being improved.

Holberton Hospital is now the subject of a master plan development project. In recent years, special infant care, radiology, and pathology have considerably improved. A new casualty/outpatient observation block is nearing completion.

Three new community health clinics are currently being planned or built, and should be operational in 1994.

The production and utilization of local foods continue to receive government attention, and there are plans for establishing a new abattoir and meat market. Small farmers continue to thrive, and fishermen are being trained in new techniques.

The environment is a major concern, especially regarding solid waste, sewage disposal in the urban area, and the protection of coastal zones. Consultants are helping to address these issues.

The Eastern Caribbean Drug Scheme, which is the central procuring agency for the members of the Organization of Eastern Caribbean States, also serves Antigua and Barbuda. Vaccines are obtained through the PAHO Revolving Fund.

The Ministry of Health is encouraging research into the country's health problems; with the progressive expansion of the health education unit's capabilities, health promotion is being strengthened and a variety of educational materials are being produced.

Several pieces of legislation are under review, particularly those dealing with the regulation of the practice of medicine, pharmacy, and allied health professions.

A maternal and child health manual that includes written standards, norms, and procedures, guides the provision of services for that population group. Immunization against diphtheria, pertussis, tetanus, polio, and measles is required for school entry.

Organization of Services

Personal Health Care Services

Infrastructure. Personal health care services include government and private health facilities. There are 6 health centers that serve as headquarters for the Medical Districts, and 17 satellite clinics linked to the health centers, which serve as subcenters for the outlying communities.

Holberton Hospital, an acute general hospital with 210 beds, provides medical, surgical, obstetric and gy-

necological, pediatric, and pathology specialties, and houses specialists in otorhinolaryngology, ophthalmology, orthopedics, and radiology. Long-term facilities include the Mental Hospital, with 150 beds; the Geriatric Finnes Institute, which provides for 100 patients; and the Leper Home. Springview Hospital in Barbuda serves mainly as an outpatient facility.

A private hospital with nine beds provides outpatient and inpatient care. There also is a group practice medical center and private practice physicians' and dentists' offices.

Organization. The Ministry of Health is responsible for providing public health services, and answers to the Cabinet of Ministers for this responsibility. Policy decisions are made by the Minister of Health and senior technical health officers. Management of the health system is delegated to the Permanent Secretary, and, through her, to the technical and administrative staff within the Ministry, hospitals, and health centers. The Chief Medical Officer is charged with advising the government on technical matters related to health and coordinating the health service.

Antigua is divided into six medical districts—St. John's City, Northern, St. John's South, Windward, St. Paul's, and St. Mary's; Barbuda is considered a separate district. Each district in Antigua is served by a government-appointed medical officer who has legal responsibility for providing all medical services in the district. All district medical officers also have private practices in the capital city of St. John's.

Medical district boundaries do not coincide with geographic parish divisions, with nursing and environmental health districts, or with property valuation and public utility divisions, which does not facilitate the coordination of community health services. Services are not allocated to the population on the basis of population ratio to health facility and/or health worker, and legislation governing the district divisions is outdated. In 1991, an assessment of health district divisions was undertaken with a view to recommending a rationalization of boundaries and catchment areas that would improve the community health service.

Functionally, health services are divided into district and hospital services, and operate as a two-tier system, although there is no clear demarcation between the two systems and primary services are offered in the acute secondary care institution, Holberton Hospital. At the district or primary level, services include maternal and child health; health education; management of common health problems; environmental sanitation; follow-up mental health care; nutrition, including food

supplementation; diabetic and hypertensive clinics; communicable disease control and surveillance; home visitation; and referral services.

Health center services are provided by family nurse practitioners, public health nurses, medical officers, district nurse midwives, community health aides, and clinic aides. At the subcenters, a district nurse midwife and a clinic aide supported by the family nurse practitioner, medical officer or public health nurse provide services. A utilization study conducted in 1990 indicated that 84,179 visits were made by clients to clinics in the seven nursing districts, and 4,369 visits were made by district nurses to homes.

The data also show that the workload for district nurse midwives is, on average, twice as heavy for nurses in urban and/or suburban areas as it is for nurses in rural areas.

District medical officers cover an average of three clinics weekly. Although clients see doctors at the health centers and subcenters, they must travel to St. John's for X-ray, laboratory, and drug services. There are referral linkages from the district or local level to the hospital.

Holberton Hospital, located in St. John's, is a secondary referral center. A nine-bed private hospital with a well-equipped operating theater and X-ray facilities also functions as a secondary facility; maternity services are also provided at this hospital.

Some tertiary level care is occasionally provided at Holberton Hospital, but most clients who require complex care are referred overseas; there are official ties with the University of the West Indies in Jamaica and the Queen Elizabeth Hospital in Barbados. Clients also receive general tertiary care in Puerto Rico and Miami and ophthalmological services in Guadeloupe and Martinique.

Coverage. Prenatal services are offered by private practitioners, government health clinics, Holberton Hospital, and the private hospital—coverage is estimated to be 95%. Normal pregnancies are seen at district clinics, and those women at risk are referred to the prenatal clinic at Holberton. Pregnant women are encouraged to attend clinic by the 12th or, at least, by the 16th week of pregnancy. The primary objective is the early detection of abnormalities and the prevention of complications arising from pregnancy, particularly pre-eclamptic toxemia and eclampsia.

Postnatal coverage remains one of the weaker aspects of the maternal and child health program. Mothers who deliver in hospital are referred to the postnatal clinic for follow-up care. Family planning services are

provided by the Antigua Planned Parenthood Association, district clinics, the adolescent health service, and private physicians. These services experience some difficulty due to the limited choice of contraceptive methods.

District nurses visit mothers and infants discharged from hospital to provide follow-up care. Infants are scheduled to attend clinics by 6 weeks of age, at which time physical, developmental, and nutritional assessments are performed and immunizations are initiated according to schedule. In 1990, 53% of infants attending clinics had done so before the age of 6 weeks.

Clinics also are held for children 1–4 years old, and they receive follow-up care until they are enrolled in primary school, where care continues.

Child abuse has been receiving attention from several sectors, including the Ministry of Home Affairs which is looking at the legislative aspects.

Progress in program activities for children with developmental disabilities has been inconsistent, but the early stimulation project and the Council for the Handicapped continue their efforts.

In 1991, immunization coverage with DPT and OPV for infants up to 1 year old was 95%. Immunization against measles, mumps, and rubella was considered successful, reaching 97% coverage of the target population in 1992. The number of immunizations with DPT and polio vaccine in 1992 exceeded the estimated target, which could be attributed to immigration of parents with infants to Antigua.

The school health program is managed by family nurse practitioners, and referrals are made to a physician when necessary. The program includes the innovative "Project Lifestyle," supported by UNICEF and CFNI, which emphasizes proper nutrition, exercise, and good health habits coupled with individual health assessments. Health and family life education in schools continues, but the Ministry of Education needs to come up with a clear written policy, and there should be greater collaboration between the Ministries of Health and Education in this activity.

The adolescent health program is very successful in meeting identified needs of teenagers. The program is managed by a family nurse practitioner, a part-time physician, and an ophthalmologist. Services include health assessment and maintenance; guidance and counseling, particularly in relation to AIDS and other sexually transmitted diseases, substance abuse, nutrition, etc.; family life education; family planning and Pap smears; and referrals. There is an average monthly attendance of 500 adolescents. The program collaborates closely with the Caribbean Family Planning As-

sociation, Antigua Planned Parenthood Association, and the family life education project of the University of the West Indies School of Continuing Education.

In 1990, there were 3,838 first visits made by persons 20 years old and older to community medical clinics. Hypertension and diabetes continue to be the leading causes of clinic attendance; clinics are scheduled for the management of persons with these two conditions, and a register of persons is maintained.

Environmental Services

The Central Board of Health within the Ministry of Health is responsible for environmental health. The functions of the department include solid and liquid waste management, water quality management, vector control, food safety, and environmental monitoring.

Solid waste management includes storage, collection, transport, disposal, and regulatory enforcement. There are five official solid waste disposal sites in Antigua, and there are also many sizeable ad hoc dumps. Plans are under way to convert a major facility at Cook's Dump, southwest of St. John's, into a sanitary landfill. Solid waste legislation (1983 Litter Act) is being enforced, and programs to promote community education and participation are being implemented.

The Antigua Public Utilities Authority has overall responsibility for managing the country's water resources. The Central Board of Health monitors drinking water quality and coastal waters. The potable water sampling program aims at collecting samples at various points in the distribution system to determine the physical, chemical, and bacteriological quality of drinking water produced and distributed by the Authority; a total of 24 samples are taken monthly. The main sources of water for municipal use in Antigua are groundwater (there are 45 operational wells); surface ponds and reservoirs; desalinated water (there are two desalination plants, although these are not always in operation and do not always produce at full capacity); and cisterns by individual householders.

In 1992, 38.8% of the inhabitants had piped water connections in their homes, 51.6% used public standpipes, and 9.6% relied on other means. The Barbuda system is supplied from a single well that serves Codrington, where most of the population lives.

There is no sewerage system in either Antigua or Barbuda—60% of the population is served by septic tanks and soakways, 30% by pit latrines, and 1%–2% by pail closets; 8% has no sanitary facilities. Sewage treatment plants, with the exception of those at Hol-

berton Hospital and at police headquarters, are located on the coast to serve the tourist hotels.

There is great concern about overall wastewater disposal and on-site sewage disposal systems, as these tend to malfunction and discharge primary treated sewage into open drains in St. John's city, or to overflow on the premises and into the gutters. Public health inspectors have received training in the principles of on-site wastewater disposal.

The Hazard Analysis Critical Control Point Approach to food safety and control is being used in restaurants in an effort to arrest the critical factors that can contribute to foodborne illness. Foods sold on the streets are given high priority because of the potential for disease. Training programs have been implemented for street vendors and food service establishment workers.

The vector control program focuses primarily on the control of mosquitoes, particularly *Aedes aegypti*. A community based integrated vector control strategy is used, involving community education and participation, source reduction, the use of larvae-eating fish in cisterns and other rain water storage areas, and household inspection and treatment. In 1991, five cycles of inspection were carried out islandwide, and 22,959 houses were inspected. The highest reported house infestation index was 11.5%, a decrease from 14% in 1989.

District environmental activities focus on identifying problems and needs and finding solutions. Some of the problems and needs encountered relate to nuisances, community water supply, solid waste storage, littering, household hazardous waste, vector control, excreta disposal, environmental health education and community participation, household sanitation, environmental health monitoring, and sanitation quality control.

Marine and coastal waters are monitored. Samples are collected from 19 sites at various beaches around the country, and land based sources of marine pollution are identified, as a way to stop or reduce pollution of inshore areas of the shoreline.

Health Promotion

Health promotion activities focus on fostering attitudes and environmental conditions that can foster good health. The peer counseling and youth health services project is one of the mechanisms being used to promote health and wellness in adolescents and young adults. Health Education programs emphasize behavior modification and lifestyle changes as one means of promoting and maintaining good health. Target groups are schoolchildren, young adults, and other community groups. Mechanisms for intersec-

toral coordination and community participation have been strengthened. The health education unit has been strengthened, and information is disseminated through several visual aids and through the media.

Available Resources

Human Resources

Health manpower is lost mainly through emigration and through nonrenewal of contracts. Retirements are few and occur mainly among nursing personnel. Medical staff usually are recruited from overseas and on contract.

The main educational institution for health personnel is the Holberton Hospital School of Nursing. It offers a 3-year program for the education and training of professional nurses in basic nursing and a 1-year program for midwifery. The school has a student capacity of 72 (60 nursing and 12 midwifery students), but actual enrollment is much lower. There are ongoing efforts to transfer the nursing educational program to the State College.

Education and/or training of other health professionals, namely in pharmacy, environmental health, and laboratory technology, is carried out at regional health institutions. In addition, health professionals participate in continuing education programs held locally and overseas. The number of health professionals in selected categories in the country is shown in Table 1.

Financial Resources

The health sector is financed mainly from the Government's annual budget, and partly from the medical benefits scheme. The health sector recurrent budget represents 12%, and is the second largest of the Government's total budget.

Public health services are mainly provided free of charge, but the private sector provides services on a fee for service basis. Only a very small percentage of revenue is collected from user fees at Holberton Hospital, but efforts are being made to improve cost recovery and the general accounting system. Social security contributors receive free hospitalization in return for a contribution to the Government by the scheme.

Capital expenditure is usually financed through local resources and through grants. In 1992, EC\$ 8,209,647 was estimated for capital expenditure. In addition, EC\$ 987,500 was estimated for capital expenditure on health facilities by the public works department. The

TABLE 1
Number of health professionals in selected categories,
Antigua and Barbuda, 1992.

| Professional category | Number |
|----------------------------------|--------|
| Physicians | 59 |
| Dentists | 13 |
| Nurses | 179 |
| Nursing auxiliaries | 43 |
| Nurses aides | 145 |
| Pharmacists | 13 |
| Nutritionists | 1 |
| Laboratory technical/assistants | 9 |
| X-ray technicians and assistants | 5 |
| Dental hygienist/assistants | 3 |

Source: Ministry of Health.

provisional figure on recurrent health sector expenditure in Antigua for 1992 was EC\$ 33,424,636, of which EC\$ 12,794,307 (38.3%) went to Holberton Hospital. Recurrent expenditure for health services in Barbuda in 1992 was EC\$ 320,500.

Other Resources

Antigua and Barbuda is one of the 10 Eastern Caribbean countries participating in the community

health information project, which aims at strengthening the countries' capabilities in the management of health information so that reliable data can be obtained for monitoring, evaluating, planning, and programming of health services. A national advisory committee and a health information unit have been established, and there is a manual of procedures in use at health centers. Equipment is being installed, and computer software will be supplied.

The central medical supply unit of the Ministry of Health is responsible for the management of drugs and biologicals. The unit is staffed by a director and four trained pharmacists, including a procurement officer. Most of the drugs available from the public sector are procured from the Eastern Caribbean Drug Supply Service.

Efforts to rationalize the system have been made by the introduction of a new Pharmacy Act, and the development of a National Formulary. Nine pharmacists dispense drugs through the government's sole outlet system at Holberton Hospital. In addition, the medical benefits pharmacy provides drugs to its beneficiaries. The operating budget of the central medical supply unit is provided through a subvention from the medical benefits scheme.

Several private pharmacies operate in Antigua, and payments are made by the medical scheme to public and private providers and institutions.

ARGENTINA

GENERAL HEALTH SITUATION AND TRENDS

Argentina is a federal republic composed of 23 provinces and the Federal Capital. By constitutional mandate, these political-administrative divisions are responsible for safeguarding and caring for the population's health. The Government that came to power in 1989—the second since the democratic system was restored in 1983—launched a series of structural changes in the economy and in the State, as well as changes in the State's relations with society in general and the central government's relations with the provincial governments.

The current economic model seeks primarily to reactivate the economy and curb inflation by deregulating economic activities. An aggressive privatization plan is being promoted, as are reforms of the State and a redefinition of its economic and social role. Through the application of this policy's principal instruments—fiscal adjustments and a national currency conversion plan—inflation has recently been relatively well controlled and macroeconomic indicators have basically stabilized. The economic, social, and sectoral changes that have been made during this period are shaping a new economy and a different form of social and institutional organization.

The last decade's economic crisis affected both the microeconomic (scale of operation, organization of industrial activity, etc.) and macroeconomic (regulatory frameworks, behavior of markets, and organization of economic and social institutions) arenas. The changing role of the State in regulating the economy, the emergence of new economic and financial groups within the country and the diversification and expansion of their production and interests, the appearance of new industrial activity centers, and changes in the orientation of foreign trade are crucial elements in this process.

Economic adjustment measures have brought on improvements in production, but they also have produced macroeconomic imbalances, especially the progressive decline in foreign sales of industrial goods,

with a corresponding influx of imported products. During 1992, for example, imports totaled more than US\$ 14,500 million, 75% more than in 1991 and more than triple the total for 1990. Consumer goods accounted for 8% of total imports in 1990, but this proportion rose to 21.4% during the first half of 1992.

As a consequence of the deregulation, privatization, and economic liberalization strategies applied during recent years, major changes also have taken place in labor markets, union activity, and public services. The pattern of accumulation has radically changed as the structural soundness of the growth models in force until the mid-1970s has been called into question, and market incentives have become the basis for the allocation of resources.

Public services, such as health, education, and social services, in which the State traditionally has played a leading role both through regulation and direct involvement, have changed and deteriorated, becoming less efficient, operational, effective, and equitable. Public sector financing has been eroding since 1982, as a result of the economic instability and inflation of the 1980s as well as adjustment measures.

Economic, political, and institutional changes have led to structural modifications, the most notable of which include an increase in critical poverty pockets; a drop in "formal" industrial employment; decreased effectiveness of the public sector's budget management and administrative mechanisms; exacerbation of the loss of efficiency, effectiveness, and equity of public spending on social needs; and a reduction in public service coverage and quality.¹

Health and Living Conditions

In the period between the launching of the national currency conversion plan in April 1991 and the beginning of 1993, the cost of the basic food basket for a typ-

¹Cetrángulo O, Damill M, Katz J, Lerner L, Ramos S. Desregulación y salud. Un análisis de la reforma del sistema de obras sociales. Buenos Aires: Fundación Industrial Argentina, Instituto para el Desarrollo Industrial; 1992. (Working document 2).

ical family rose 56%, whereas industrial workers' salaries increased only 27%. Reduced inflation (as measured by the change in the monthly consumer price index, which in April 1993 was only 1.0%) and expanded productivity of the work force (a 10% increase in 1991–1992) led to a slight rise in the rate of activity, calculated as the percentage of the total population that is economically active (economically active population, or EAP); this percentage grew from 39.4% in 1988 to 40.2% in 1992. Nevertheless, during the last 5-year period, the rate of open unemployment (unemployed persons seeking employment) rose from 6.1% to 7.0% of the EAP (INDEC, Ongoing Survey of Households). In greater Buenos Aires, where one-third of the country's population is concentrated, unemployment has doubled since 1980. The increase has been particularly marked among persons aged 50–64, rising from 1.2% in 1980 to 6.7% in 1992. This, coupled with a progressive reduction in retirement pensions of persons older than 65, has deteriorated the purchasing power and the quality of life for a sizable segment of the population. The proportion of persons over 65 in the economically active population has declined slightly. Of the population between 65 and 74 years old, 33.7% work; among those aged 75 and older, the figure is 15.8%. Under the current system, the retirement age for men is 65 and for women, 60; early retirement is an option in some cases. This system, which is experiencing an acute financial crisis, pays retirees a minimum monthly benefit of about US\$ 200.

The housing shortage persists and has become an important health and social risk factor. It is estimated that even if 100,000 new housing units were to be constructed each year, it would take more than 30 years to overcome the shortage. According to calculations by the Department of Housing and Environmental Quality, 12,850,000 people (34.7% of the population) live in substandard housing: 10.6% in irreparable dwellings, 18.2% in dwellings that are in poor condition but repairable, and 5.9% in overcrowded conditions. This situation has given rise to several phenomena, including the establishment of slums or shantytowns—which in the Federal Capital alone are home to 60,000 people—or, more recently, the illegal occupation of uninhabited houses by poor families, who live in sanitary conditions that are even worse than those in the shantytowns because they lack access to basic services and effective social assistance networks.

Regarding education, although no changes were noted in the trends registered during the 1980s, major differences were seen from province to province. For example, the percentage of the cohort registered in first

grade that went on to complete seventh grade was 62.9% for the entire country, but ranged from as low as 20.0% in the Province of Chaco to 80.6% in the Federal Capital. The percentage of repeaters out of the total enrollment in public primary schools was 7.9% for the country as a whole, but ranged from 16.1% in the Province of Santiago del Estero to 1.7% in the Federal Capital.

The only available figures that can quantify the differences between the provinces deal with health indicators, which, despite the gains registered, continue to show sizable differences related to living conditions. This is particularly telling in terms of the infant mortality rate, which in 1990 was 16.8 per 1,000 live births in the Federal Capital but was at least twice that in the provinces of Salta (32.3), Jujuy (35.8), Formosa (33.2), Chaco (35.8), and Catamarca (34.6). The province of Salta, where the basic needs of 46.8% of the population are not being met—one of the highest percentages in the country—was the province hardest hit by the cholera outbreak in January 1992.

Population

Preliminary data from the 1991 national population and housing census showed the population of Argentina to be 32,608,687, an increase of 4,700,000 people over the 1980 figure; this represents a 16.7% relative change between censuses, and it is a slow rate of population growth. It is assumed that the slowed growth is more the result of a reduction in migration than a decline in national population growth, since no significant changes in birth and death rates have been registered as compared to the previous decade. Most of the population (85%) lives in urban areas, and the country still has broad uninhabited expanses. The decline in the infant mortality rate (from 33.2 to 25.6 per 1,000 live births) and in the general mortality rate (from 8.6 to 8.0 per 1,000 population) in 1980–1990 helped raise life expectancy from 65.4 years for men and 72.1 years for women in 1975–1980 to 67.3 years for men and 74.0 years for women in 1985–1990.

The geographic distribution of the population has remained relatively stable, with a small increase in the most sparsely populated provinces and a decrease in growth rates in the Federal Capital, greater Buenos Aires, and the provinces of Córdoba and Santa Fe. Interjurisdictional migration from rural and suburban departments to departments where capital cities are located also has been observed. Whereas the 1947 census showed only three capital departments with more than

30% of the provincial population, in 1990 there were 15. There has been a noticeable decline in absolute population growth in the 19 districts of greater Buenos Aires, which indicates a tapering off of the migratory flows these districts have traditionally received from other regions.

In the Patagonian provinces, where various promotional policies have been applied, average growth rates of more than 30 per 1,000 have been maintained as a result of the oil boom, major hydroelectric projects, and the industrialization of mining resources.

The age distribution of the population shows a trend toward growth in the group 60 years old and older (13.1%) and a decrease in the groups aged 0–24 years (46.0%) and 25–59 years (40.8%).

Mortality

In 1990 the age-specific mortality rates were 1.1 per 1,000 population for those aged 1–4 years, 0.3 for those 5–14 years old, 1.8 for those 15–49 years old, 11.5 for those 50–64 years old, and 54.0 for those 65 years old and older, with differences between the provinces as a result of different living conditions.²

There were clear sex differences in mortality, particularly at older ages: males and females had respective specific mortality rates of 1.2 and 1.0 per 1,000 in the 1–4 age group, 0.4 and 0.3 in the 5–14 age group, 2.2 and 1.3 in the 15–49 age group, 15.8 and 7.3 in the 50–64 age group, and, finally, 63.5 and 46.0 per 1,000 in the age group 65 years old and older.

Regarding the infant mortality trend between 1981 and 1985, the rate decreased from 33.6 to 26.2 per 1,000 live births, while in the following 5-year period, 1986–1990, the rates fluctuated only slightly, decreasing slowly from 26.9 per 1,000 live births in 1986 to 25.6 in 1990.

An analysis of causes of death between 1980 and 1990 shows a progressive growth in the proportional percentage of heart disease (ICD-9, 390–429), malignant neoplasms (140–208), and cerebrovascular disease (430–439), which increased from 29.9% to 31.4%, from 16.1% to 17.9%, and from 9.3% to 10.1%, respectively.

Table 1 shows the evolution of mortality by age group and by major groups of causes between 1980

and 1990. In the population under 1 year old, death rates from pneumonia and influenza and from intestinal infectious diseases declined substantially, dropping from 270 to 99 per 100,000 live births for the first group, and from 244 to 79 per 100,000 for the second. Mortality from congenital anomalies, heart disease, nutritional deficiencies, and accidents fluctuated within relatively small ranges. In the 1–4 age group the same trends were observed, except in the case of mortality from accidents, which decreased during the period, although the percentage share of this group of causes has increased. The same thing occurred in the group aged 5–14. It is worth noting that in many cases the lowest levels occurred in 1985.

Among adults, for the group aged 15–49 the rates for the five groups of causes fell and that for homicides increased. The major reductions occurred between 1980 and 1985, with less change noted between 1985 and 1990. For the group aged 50–64, mortality from heart disease, accidents, and cirrhosis of the liver declined, while death rates from malignant neoplasms and cerebrovascular disease remained practically constant.

Among those 65 years old and older, during the past decade all the proportions and rates remained stable, except for mortality from atherosclerosis, which decreased from 473 per 100,000 in 1980 to 305 in 1985 and to 240 in 1990, and mortality from pneumonia and influenza, which reached its lowest point in 1985 (166 in 1980, 126 in 1985, and 164 in 1990).

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

For children under 1 year old, the groups of causes of death for which the rates decreased the most between 1985 and 1990 were pneumonia and influenza (ICD-9, 480–487), which fell from 134.1 per 100,000 live births in 1985 to 98.7 in 1990, and intestinal infectious diseases, which went from 113.2 per 100,000 to 78.5 in the same period. Causes that can be considered avoidable continue to account for a significant proportion of deaths—in 1990 only 16% of neonatal deaths and 23.9% of postneonatal deaths were caused by diseases considered unavoidable.

Among children aged 5–14, although mortality from accidents decreased from 15.8 to 10.9 per 100,000 between 1980 and 1990, this cause continued to produce one-third of the deaths in this age group. The next

²Ministerio de Salud y Acción Social. *Estadísticas vitales. Información básica*. Buenos Aires: Ministerio de Salud y Acción Social; 1990. (Series 5, 34).

Argentina

TABLE 1
Five leading causes of death by age group, Argentina, 1980, 1985, and 1990.

| Principal causes of death (ICD-9) | 1980 | | | | 1985 | | | | 1990 | | | |
|---|------|---------|---------|-------|------|---------|---------|-------|------|---------|---------|-------|
| | Rank | Number | Rate | % | Rank | Number | Rate | % | Rank | Number | Rate | % |
| All ages | | | | | | | | | | | | |
| Total deaths | | 241,125 | 862.8 | 100.0 | | 241,377 | 795.8 | 100.0 | | 259,683 | 803.4 | 100.0 |
| Heart disease (390-429) | 1 | 72,146 | 258.1 | 29.9 | 1 | 77,098 | 254.2 | 31.9 | 1 | 81,632 | 252.6 | 31.4 |
| Malignant neoplasms (140-208) | 2 | 38,961 | 139.4 | 16.1 | 2 | 42,407 | 139.8 | 17.6 | 2 | 46,440 | 143.7 | 17.9 |
| Cerebrovascular disease (430-438) | 3 | 22,418 | 80.2 | 9.3 | 3 | 23,859 | 78.7 | 9.9 | 3 | 26,113 | 80.8 | 10.1 |
| Accidents (E800-E949) | 4 | 11,895 | 42.6 | 4.9 | 4 | 9,914 | 32.7 | 4.1 | 4 | 10,532 | 32.6 | 4.1 |
| Atherosclerosis (440) | 5 | 11,704 | 41.9 | 4.8 | — | 8,361 | 27.6 | 3.5 | — | 7,324 | 27.2 | 2.8 |
| Certain conditions originating in the perinatal period (760-779) | — | 10,510 | 37.6 | 4.4 | 5 | 8,784 | 29.0 | 3.6 | 5 | 8,600 | 26.6 | 3.3 |
| Under 1 year old | | | | | | | | | | | | |
| Total deaths | | 23,167 | 3,321.6 | 100.0 | | 17,034 | 2,617.1 | 100.0 | | 17,348 | 2,556.3 | 100.0 |
| Certain conditions originating in the perinatal period (760-779) | 1 | 10,465 | 1,500.4 | 45.2 | 1 | 8,546 | 1,313.0 | 50.2 | 1 | 8,600 | 1,267.2 | 49.6 |
| Congenital anomalies (740-759) | 2 | 2,386 | 342.1 | 10.3 | 2 | 2,209 | 339.4 | 13.0 | 2 | 2,531 | 372.9 | 14.6 |
| Pneumonia & influenza (480-487) | 3 | 1,889 | 270.8 | 8.2 | 3 | 873 | 134.1 | 5.1 | 4 | 670 | 98.7 | 3.9 |
| Intestinal infectious diseases (001-009) | 4 | 1,699 | 243.6 | 7.3 | 4 | 737 | 113.2 | 4.3 | — | 533 | 78.5 | 3.1 |
| Heart disease (390-429) | 5 | 702 | 100.7 | 3.0 | — | 495 | 76.1 | 2.9 | 3 | 707 | 104.2 | 4.1 |
| Nutritional deficiencies (260-269) | — | 611 | 87.6 | 2.6 | 5 | 522 | 80.2 | 3.1 | — | 567 | 83.5 | 3.3 |
| Accidents (E800-E949) | — | 633 | 90.8 | 2.7 | — | 485 | 74.5 | 2.8 | 5 | 658 | 97.0 | 3.8 |
| 1-4 years old | | | | | | | | | | | | |
| Total deaths | | 3,971 | 152.9 | 100.0 | | 2,768 | 99.5 | 100.0 | | 2,756 | 107.3 | 100.0 |
| Accidents (E800-E949) | 1 | 710 | 27.3 | 17.9 | 1 | 524 | 18.8 | 18.9 | 1 | 559 | 21.8 | 20.3 |
| Pneumonia & influenza (480-487) | 2 | 372 | 14.3 | 9.4 | 2 | 232 | 8.3 | 8.4 | 4 | 200 | 7.8 | 7.3 |
| Intestinal infectious diseases (001-009) | 3 | 364 | 14.0 | 9.2 | 3 | 173 | 6.2 | 6.2 | — | 181 | 7.0 | 6.6 |
| Congenital anomalies (740-759) | 4 | 231 | 8.9 | 5.8 | 4 | 157 | 5.6 | 5.7 | 3 | 215 | 8.4 | 7.8 |
| Nutritional deficiencies (260-269) | 5 | 209 | 8.0 | 5.3 | — | 166 | 6.0 | 6.0 | 5 | 199 | 7.7 | 7.2 |
| Heart disease (390-429) | — | 183 | 7.0 | 4.5 | 5 | 173 | 6.1 | 6.2 | 2 | 231 | 9.0 | 8.4 |
| 5-14 years old | | | | | | | | | | | | |
| Total deaths | | 2,423 | 46.2 | 100.0 | | 2,241 | 37.3 | 100.0 | | 2,219 | 34.4 | 100.0 |
| Accidents (E800-E949) | 1 | 829 | 15.8 | 34.2 | 1 | 723 | 12.0 | 32.3 | 1 | 705 | 10.9 | 31.8 |
| Malignant neoplasms (140-208) | 2 | 300 | 5.7 | 12.4 | 2 | 327 | 5.4 | 14.6 | 2 | 282 | 4.4 | 12.7 |
| Heart disease (390-429) | 3 | 166 | 3.2 | 6.8 | 3 | 168 | 2.8 | 7.5 | 3 | 168 | 2.6 | 7.6 |
| Pneumonia & influenza (480-487) | 4 | 96 | 1.8 | 4.0 | 4 | 67 | 1.1 | 3.0 | 4 | 67 | 1.0 | 3.0 |
| Congenital anomalies (740-759) | 5 | 89 | 1.7 | 3.7 | 5 | 64 | 1.1 | 2.8 | 5 | 109 | 1.7 | 4.9 |
| 15-49 years old | | | | | | | | | | | | |
| Total deaths | | 29,664 | 220.8 | 100.0 | | 27,044 | 187.7 | 100.0 | | 27,845 | 179.8 | 100.0 |
| Heart disease (390-429) | 1 | 5,593 | 41.6 | 18.8 | 1 | 5,066 | 35.2 | 18.7 | 1 | 5,211 | 33.7 | 18.7 |
| Accidents (E800-E949) | 2 | 5,126 | 38.2 | 17.3 | 2 | 3,916 | 27.2 | 14.5 | 2 | 3,932 | 25.4 | 14.1 |
| Malignant neoplasms (140-208) | 3 | 4,775 | 35.5 | 16.1 | 3 | 4,976 | 34.6 | 18.4 | 3 | 5,234 | 33.8 | 18.8 |
| Cerebrovascular disease (430-438) | 4 | 1,881 | 14.0 | 6.3 | 4 | 1,917 | 13.3 | 7.1 | 4 | 2,073 | 13.4 | 7.4 |
| Cirrhosis of the liver (571) | 5 | 972 | 7.2 | 3.3 | — | 681 | 4.7 | 2.6 | — | 655 | 4.2 | 2.4 |
| Homicide (E960-E969) | — | 733 | 5.3 | 2.5 | 5 | 1,068 | 7.4 | 3.9 | 5 | 1,134 | 7.3 | 4.1 |
| 50-64 years old | | | | | | | | | | | | |
| Total deaths | | 47,104 | 1,411.5 | 100.0 | | 47,564 | 1,167.8 | 100.0 | | 48,495 | 1,148.9 | 100.0 |
| Heart disease (390-429) | 1 | 14,504 | 388.1 | 30.8 | 1 | 14,706 | 361.1 | 30.9 | 1 | 14,384 | 340.8 | 29.7 |
| Malignant neoplasms (140-208) | 2 | 11,969 | 320.3 | 25.4 | 2 | 13,105 | 321.8 | 27.6 | 2 | 13,438 | 318.4 | 27.7 |
| Cerebrovascular disease (430-438) | 3 | 4,578 | 122.5 | 9.7 | 3 | 4,875 | 119.7 | 10.2 | 3 | 5,211 | 123.5 | 10.7 |
| Accidents (E800-E949) | 4 | 1,920 | 51.4 | 4.1 | 4 | 1,575 | 38.7 | 3.3 | 4 | 1,592 | 37.7 | 3.3 |
| Cirrhosis of the liver (571) | 5 | 1,515 | 40.5 | 3.2 | 5 | 1,377 | 33.8 | 2.9 | 5 | 1,287 | 30.5 | 2.7 |

TABLE 1 (cont.)

| Principal causes of death (ICD-9) | 1980 | | | | 1985 | | | | 1990 | | | |
|--------------------------------------|------|---------|---------|-------|------|---------|---------|-------|------|---------|---------|-------|
| | Rank | Number | Rate | % | Rank | Number | Rate | % | Rank | Number | Rate | % |
| 65 years old and older | | | | | | | | | | | | |
| Total deaths | | 132,614 | 5,776.6 | 100.0 | | 140,275 | 5,372.5 | 100.0 | | 158,901 | 5,395.6 | 100.0 |
| Heart disease (390-429) | 1 | 50,381 | 2,194.6 | 38.0 | 1 | 55,708 | 2,133.6 | 39.7 | 1 | 60,432 | 2,052.0 | 38.0 |
| Malignant neoplasms (140-208) | 2 | 21,443 | 934.0 | 16.2 | 2 | 23,425 | 897.2 | 16.7 | 2 | 27,070 | 919.2 | 17.0 |
| Cerebrovascular disease (430-438) | 3 | 15,709 | 684.3 | 11.8 | 3 | 16,701 | 639.6 | 11.9 | 3 | 18,585 | 631.1 | 11.7 |
| Atherosclerosis (440) | 4 | 10,860 | 473.3 | 8.2 | 4 | 7,975 | 305.4 | 5.7 | 4 | 7,066 | 239.9 | 4.4 |
| Pneumonia & influenza (480-487) | 5 | 3,804 | 165.7 | 2.9 | 5 | 3,288 | 125.9 | 2.3 | — | 4,830 | 164.0 | 3.0 |
| Diabetes mellitus (250) | — | 3,114 | 135.5 | 2.3 | — | 3,427 | 131.3 | 2.4 | 5 | 4,070 | 138.2 | 2.6 |

Notes: Mortality rates in the under-1 age group are per 100,000 live births. In the other age groups, the rates are per 100,000 population.

Deaths in which sex was not specified were distributed proportionally among males and females.

Source: National Health Statistics Program, Vital Statistics, Ministry of Health and Social Action, 1990.

leading cause was malignant neoplasms, which accounted for 12.7% of the total in 1990.

An analysis of age-specific mortality reveals that among children under 1 year old, three groups of causes account for two-thirds of all deaths: certain conditions originating in the perinatal period (34.1%), diseases of the respiratory system (22.3%), and intestinal infectious diseases (14.9%). In the group aged 1-4, almost half (43.3%) of the deaths are due to the latter two causes.

Adolescent and Adult Health

In 1990, in the population older than 15 years old, heart disease causes the greatest percentage of deaths. This cause accounted for 18.7% of all deaths in the 15-49 age group and 29.7% in the 50-64 age group. Malignant neoplasms are the second leading cause of death, with rates of 33.8 and 318.4 per 100,000 for the two age groups, respectively. Accidents resulted in 5,524 deaths and are the third most important cause of death in the group aged 15-49 and the fourth among those 50-64.

In the age group 15-64 years old, acute myocardial infarction ranks first as a cause of death, accounting for 21% of the deaths from the 10 leading causes in this group, followed by acute cerebrovascular disease, accounting for 15%, and malignant neoplasm of the trachea, bronchus, and lung, which account for 14%.

Health of the Elderly

Morbidity studies carried out in 1991 with data from the National Institute of Social Services for Retirees

and Pensioners showed that in major urban areas 10% of doctor visits are for bone and joint disorders, 20% for cardiovascular disorders, 15% for ophthalmologic disorders, and 10% for urological disorders. With regard to the causes associated with health institution discharges, cardiovascular diseases account for 30%, diseases of the digestive system for 12%, injuries for 10%, respiratory diseases for 9%, malignant neoplasms for 9%, and metabolic disorders for 7%.

Health of Women

Excluding specific pathological risks from consideration, the main problems that the country's women face are violence and social and employment inequities.

The percentage of illiteracy has decreased. In 1960 it was 6.6% among men and 8.7% among women, but in 1980 it had fallen to 5.3% and 5.7%, respectively. The situation in the labor market also changed significantly, with a doubling in the number of women in the work force, particularly in the category "office and manual workers;" in addition, the proportion of women in the economically active population rose from 21% to 29.6%. Of working women, 50.4% were married, and 22.9% of all married women worked. Census data also showed that more separated and widowed women than married women worked.

Between 1970 and 1990, as a result of measures targeted to groups at highest risk (women under 15 and women over 35), maternal deaths were reduced by 50%, although the total rate for the country (5.2 per 10,000 live births) remains high, considering that between 85% and 95% of deliveries are performed in health care institutions. In the northeastern, northwestern, and Cuyo regions, maternal age is lower than

the national average, fertility is higher, and so is the rate of maternal mortality (8.0 per 10,000 live births).

Workers' Health

There continues to be a shortage of reliable data on occupational accidents and diseases. The existing information system has not worked well and little useful research has been conducted. A particularly serious problem is the lack of epidemiologic research in the field of occupational health, as well as the scarcity of specialists in occupational health and safety.

Diseases and Health Impairments

Vector-borne Diseases

Chagas' disease continues to be the most important endemic parasitic disease in Argentina. In the rural portions of endemic areas, epidemiologic studies have demonstrated not only a high rate of Chagas' infection, but also a greater proportion of electrocardiographic irregularities among the inhabitants with positive serology. According to a study published in 1992, the serological prevalence among military conscripts was estimated at 5.78%, whereas in 1964–1969 it had been 10.13%. The substantial decline is the result of control programs and better hygiene in housing in the endemic regions.³

The number of reported cases of leishmaniasis fluctuated between 165 in 1988 and 111 in 1989, and between 224 in 1990 and 155 in 1992. The most heavily affected provinces continue to be Salta, Jujuy, and Santiago del Estero.

In 1990, a total of 727 cases of Argentine hemorrhagic fever was reported, twice the incidence of 1988 (339 cases) and 1989 (330 cases) in the endemic area (provinces of Córdoba, Santa Fe, and Buenos Aires). The number of reported cases in 1992 fell to 92.

The rate of malaria in 1990 remained stable at 4.5 per 100,000, basically due to the reduction in prevalence in the province of Misiones, where 219 cases were recorded in 1989 but only 88 in 1990. The highest concentrations of cases are found in the northeast, especially in Salta, Jujuy, and Tucumán.

Vaccine-preventable Diseases

The country's last measles epidemic occurred in 1984, with a rate of 111.9 per 100,000 population. The rate dropped to 5.8 per 100,000 in 1990, as a result of an increase in vaccination coverage, which peaked at a level of 97% of children in 1 year. Most of the provinces suffered epidemic outbreaks of measles between September 1991 and February 1992. The provinces of Córdoba, Chaco, Chubut, Mendoza, and San Juan had the most cases. The total number registered between 1991 and 1992 was 62,644 cases, for a rate of approximately 100 per 100,000 population. In 1993, Argentina joined the campaign to eliminate this disease.

In 1992, seven cases of neonatal tetanus were reported, but underreporting is suspected, since in previous years the figure was substantially higher (70 cases in 1989). Although separate reporting of neonatal tetanus and other forms of the disease is compulsory, difficulties in recognizing cases are considerable. In 1993, a plan for the elimination of neonatal tetanus was implemented, that calls for vaccination of all women of childbearing age (14–49 years) in the eight provinces in which cases were reported during the period.

In 1992, 4 cases of diphtheria were reported from four different provinces, as compared to 20 in 1989, when an outbreak occurred in the province of Misiones, causing one death.

A total of 101 cases of flaccid paralysis were reported. Intensive surveillance programs are being conducted with a view to eradicating wild poliovirus.

In the last 5 years, the number of cases of whooping cough reported remained under 2,500. Although several provinces experienced increases in 1992 (Catamarca, Mendoza, San Juan, and Salta), the overall trend points toward a decrease. The last epidemic occurred in 1987, with 8,600 reported cases.

Lack of specific immunization against mumps and rubella in many provinces created favorable conditions for outbreaks in 1992. In that year, 40,000 more cases of mumps were reported than in 1991, owing to the increase of cases in the provinces of Buenos Aires, Córdoba, Mendoza, and Santa Fe. (In 1989, the total number of cases was 53,379.) During 1992, epidemics of rubella occurred in all the provinces (85,026 cases in 1992, compared to 21,705 in 1989).

Cholera and Other Intestinal Infectious Diseases

In January 1992, during the fourth epidemiologic week, the first case of cholera was reported in the area

³Milei J, Storino R, Barragán H. Aspectos epidemiológicos de la enfermedad de Chagas en la Argentina y América Latina. *Revista de la Federación Argentina de Cardiología*. 1992; 21(3):239-246.

of Pilcomayo, in the province of Salta, along the border between Argentina and Bolivia. The epidemic mainly affected the provinces of Salta and Jujuy, producing 553 cases with 15 deaths in 1992. In January 1993, a new outbreak occurred, with 966 cases and 9 deaths, and cases were reported in previously unaffected provinces such as Tucumán, Mendoza, Santa Fe, Santiago del Estero, and Chaco. The most important epidemic foci were in the provinces of Salta and Jujuy, in areas that typically have water supply and excreta disposal problems and poor hygiene and working conditions, and whose residents live in a context of structural poverty and marginalization. To these sanitary and social difficulties the disease added major economic losses, estimated at US\$ 6 million, as a result of diminished tourism and the daily expenditure of US\$ 150,000 per day for surveillance along the northern border.

Notification of diarrheal diseases tripled in some provinces, as a result of the surveillance program implemented after the first cholera outbreak. Figures on the regional distribution of these diseases indicate that the incidence has historically been higher in the northeastern provinces, which have serious problems with water supply and excreta disposal.

Tuberculosis

The number of tuberculosis cases decreased from 15,987 in 1985 to 12,453 in 1989. Of this last figure, 9,704 cases were pulmonary tuberculosis and 5,787 were sputum-positive. In 1992, 8,504 cases were reported.

Rabies, Foot-and-Mouth Disease, and Other Zoonoses

The number of cases of rabies in animals dropped from 5,573 to 50 in a decade (a 99.2% reduction), and no cases of rabies in humans have been reported since 1985. The occurrence of animal cases is limited to a few provinces: Tucumán, Córdoba, Buenos Aires, and Santa Fe. The number of foot-and-mouth disease foci decreased from 1,239 in 1985 to 350 in 1992, with an average of 502 between 1985 and 1989, and of 308 between 1990 and 1992.⁴

⁴Servicio Nacional de Sanidad Animal. Informe periódico sobre distribución estacional de la aftosa en la Argentina, Promedio 85/89/Ocurrencia 1993. Buenos Aires: SENASA; 11 June 1993:25.

In 1992, a significant outbreak of trichinosis occurred in the province of Buenos Aires (more than 100 cases), and cases also were reported in Córdoba and Chubut. Reported cases of brucellosis increased only in Catamarca (722 cases in 1992).

AIDS and Other Sexually Transmitted Diseases

Syphilis and gonorrhea rates remained low (0.2 per 1,000 and 0.4 per 1,000, respectively, in 1990), but AIDS continued to spread. As of 31 March 1993, a cumulative total of 2,456 cases had been reported in the country (145 up to 1987, 169 in 1988, 228 in 1989, 388 in 1990, 478 in 1991, and 605 in 1992). With regard to the age of AIDS patients, at first the epidemic was confined to adults, but then began to spread to adolescents and young people: 69.4% of the cases reported up to 1988 were in persons 30 years old or older, compared with 53% in 1989 and 1990. The means of contagion have shifted from a predominantly sexual transmission (80%-100% of cases between 1982 and 1987) to an increasingly frequent transmission through blood, which accounted for 40% in 1990, with clear predominance of transmission through intravenous drug use (34.2% of the total). In just 4 years, the percentage of cases reported among intravenous drug addicts has tripled, and it has doubled among heterosexuals. At the same time, transmission of the virus through blood transfusions has decreased thanks to control measures instituted in blood banks.

Cardiovascular Diseases

Diseases of the heart (ICD-9, 390-429) continue to be the leading cause of death. Cerebrovascular disease (430-438) ranks third, and atherosclerosis (440) ranks fifth. In 1990, acute myocardial infarction was the most frequent underlying cause (16,874 deaths), especially among men (10,595 deaths). During the same year, other ischemic diseases, dysrhythmia, and hypertensive disease accounted for 7,435, 11,913, and 4,058 deaths, respectively, with no major differences by sex. Cardiovascular disease was the leading cause for doctor visits in the country. Hypertensive disease (401-405) and cerebrovascular disease (430-438) after 55 years of age, and heart disease (415-429) after age 65 accounted for 20% of all doctor visits. Studies of morbidity from cardiovascular disease showed a high prevalence of several risk factors: hyperlipidemia (44%), overweight (40%), arterial hypertension (17%),

diabetes (7%), and minor electrocardiographic abnormalities (7%) in adults aged 40–60.

Malignant Neoplasms

Between 1980 and 1990, mortality from malignant neoplasms changed very little, both in terms of rates (139.4 per 100,000 in 1980, 139.8 in 1985, and 143.7 in 1990) and in percentages (16.1%, 17.6%, and 17.9%). In men, 42.1% of deaths from this cause were due to malignant neoplasm of the trachea, bronchus, and lung, followed by malignant neoplasm of the stomach (14.8%), prostate (12.4%), colon (10.1%), and esophagus (9.6%). In women, the most frequent types are malignant neoplasm of the breast (23.3%), uterus (13.2%), colon (10.0%), and stomach (8.2%).

Accidents and Violence

Accidents rank fourth as a cause of death for all ages. Although the rate of accidents declined from 42.6 per 100,000 population in 1980 to 32.6 in 1990, they are still a cause for serious concern, given that they are avoidable and they take a high toll in years of potential life lost. The percentage share of accidents among the leading causes of death increased in 1990 for the age groups under 1, 1–4, and 15–49, but decreased for all other ages. Mortality rates from external causes were almost four times higher for men than for women; as a result, the figure for years of potential life lost was three times higher for men than for women.

Behavioral Disorders

Mental disorders (ICD-9, 290–319) accounted for 5% of health institution discharges in 1990. The percentage ranges from 3% in the 25–29 age group up to 7.5% in the 45–49 age group, with values close to the average for the elderly. The ratio of men to women hospitalized for mental disorders is 2:1, while the male-female ratio for suicides is 3:1.

Oral Health

Of the population up to 19 years old, 86% has dental caries, 90% has gingival disease, and 55% malocclusion. Among adults, the figures are 98% for gingival disease, 50% for dental caries, and up to 94% for loss of

one or more teeth. In the population aged 65 or older, 30% has experienced total loss of either the upper or lower teeth or both, 30% has dental caries, and 70% has gingival and periodontal disease. Mouth cancer accounts for 2%–5% of all malignant neoplasms in this age group.

Risk Factors

The most recent information indicates that in the late 1980s the country had serious shortfalls in sanitation services coverage. Only 67% of the urban population and 43% of the rural population had access to public drinking water supply systems. The average coverage of the sewage system for the urban population was 39%. Almost 90% of the total population had some type of excreta disposal system.

There are no regulations to govern the settlement of the ever growing population that moves from rural to suburban areas. This population shift, which exacerbates the shortage of housing and sanitation and water supply infrastructure, primarily affects greater Buenos Aires and the northeastern provinces.

Argentina's environmental problems are quite varied. The country has extensive semiarid areas, since 70% of the country's water resources are concentrated in 30% of the territory (in the northern area). Human activity has led to the deterioration of forest ecosystems, resulting not only in the loss of flora and fauna resources, but also in serious erosion. It is estimated that 80 million tons of sediment are being deposited into the River Plate basin every year. An air quality monitoring system has yet to be set up, but it is known that air quality in major cities is poor from particulate matter. In addition, noise pollution is serious and worsening in cities with more than 500,000 inhabitants.

The Government has acknowledged that the quality of water resources continues to deteriorate and that water sources are being contaminated by industrial wastes. Studies conducted by the National Institute of Water Science and Technology have found that industrial and sewer effluent discharges, along with the presence of organochlorine and organophosphate products, are the main water contamination factors.

Other studies have found excessive levels of fluorine and arsenic (provinces of La Pampa, Santa Fe, Córdoba, Chaco, Santiago del Estero, and Tucumán) and nitrates (greater Buenos Aires and greater La Plata). It is estimated that 65% of wastewater is discharged in surface waterways without any treatment.

Risks from air and atmospheric pollution have increased in recent years, especially in major urban and suburban areas. An estimated 70% of the pollutants are produced by mobile sources, both automobiles and diesel-powered mass transit vehicles.

In the 4-year period between 1989 and 1992, Argentina suffered several natural disasters, which brought on severe economic consequences; these included floods in several of the country's river basins, especially in the northeast and the central portion of Buenos Aires province. In 1991, the eruption of the Hudson volcano in the Andes mountains did not cause any human deaths, but killed hundreds of animals and caused huge economic losses as a result of ruined crops and equipment.

Two serious poisoning incidents occurred in 1992. The first, which caused 27 deaths and almost 100 cases of poisoning, resulted from methanol contamination of a batch of wines produced in the province of San Juan. The second, which was responsible for 23 deaths and prompted thousands of people to seek medical attention throughout the country, was caused by the use of diethylene glycol rather than polyethylene glycol in processing propolis, a substance produced by bees to protect honeycombs, and that has been used empirically for several years now by various segments of the population as an anti-infectious and revitalizing agent. In the Federal Capital alone, 9,024 patients were treated by the health system, and 35% of those hospitalized as a result of the poisoning died.⁵

SOCIAL RESPONSE TO HEALTH PROBLEMS

Health Policies and Strategies

The country's health services system is composed of three subsectors: public, social security, and private, with services heterogeneously distributed in 23 provinces, the Federal Capital, and hundreds of municipalities, which have considerable autonomy to organize and execute health activities. Despite the system's complexity and fragmentation, its different services are interdependent, owing to a form of financing that economists call "subsidized supply," whereby subsidies are provided through social security and public funds, and payment is made by "service unit,"

according to a schedule of fees determined through negotiation between financing entities and providers. This system is currently in crisis and new ways of structuring and operating the country's health system are being sought.

The current intense debate about the future of the system of services centers on how to pay for medical care. The discussion is being led by health economists whose prime concern is cost-effectiveness, and the debate rests on what has come to be a generally accepted premise—there will be severe restrictions on spending in the immediate future, and spending must, therefore, be reoriented in order to increase efficiency. The controversy revolves around whether the preferable model is "subsidized supply" (the current system) or "subsidized demand" (a model being tested in many countries).

Efforts to restructure the health system rely on two basic strategies: decentralization and, to a certain extent, deregulation. These strategies serve as the political and economic basis for the principal health reforms currently being pursued, namely, the reform of the social security system, a reorganization of public health care services, and a change in the role of the Department of Health.

In the State reform framework, the Department of Health has been transferring the health care services that remained under its jurisdiction to the provinces and municipalities, thus ending, after several 5-year periods, a long history of direct State responsibility. The Department maintains a set of national institutes and administrative units that are essentially designed to set policy and ensure articulation with the provinces, regulate, monitor, set standards, and provide technical support to the critical elements and strategic approaches of the health care system.

In recent 5-year periods, the evolution of the health sector has been characterized by imbalances which were exacerbated during the second half of the 1980s. Although private sector continued to be dynamic (new care facilities, prepayment schemes, and growth in highly complex technology), there were evident signs of crisis in this form of organization. Contraction of the market and the breakdown of traditional mechanisms of social security financing led to the disarticulation of this subsector.

At the same time, the public infrastructure, which was already in a state of crisis, was forced to meet the demand from needy segments of the population, including those left unprotected as a result of the loss of social security coverage. It should be noted that for many years now the public services at the na-

⁵Vallejo NE. Intoxicación por propóleo contaminado con di-etilenglicol. *El Derecho a la Salud*. 11 June 1993:25.

tional, provincial, and municipal levels have been structurally and functionally overburdened by that demand.

For the past 3 years, several public and private initiatives have been launched within the sector to address this critical situation. The mechanisms proposed for optimizing the allocation of resources include adopting universal fee schedules, decentralizing the remaining public hospitals from the national level to other levels, establishing programs for the accreditation and classification of inpatient care facilities, lifting the controls of fees in social security institutions, and pursuing a more widespread use of the therapeutic formulary. Other important initiatives under way include the utilization of the self-management model in public hospitals and the implementation of the program for health care quality assurance.

An important development for the health sector was the promulgation of a national health policy in July 1992, which establishes the following fundamental objectives: improvement of the accessibility, efficiency, and quality of medical care; strengthening of health promotion and protection activities focusing on specific population groups; and redefinition and reorientation of the role of the State's health sector on the basis of federalization and decentralization processes. Crucial to the achievement of these objectives is the development of human resources and capabilities in the area of regulation and control of drugs, technology, food, and critical inputs. To that end, the National Drug, Food, and Technology Administration recently has been created.

Another policy area set as a priority is the development of programs and activities to strengthen health promotion and disease prevention. The National Department of Occupational Health and Safety is carrying out various research programs with a view to remedying the lack of information about workers' health, including the national survey on working conditions and environments and a study of specific aspects of child labor. The Department of Occupational Medicine of the Ministry of Health and Social Action, with support from the National Program for Technical Assistance to the Social Sectors, also is engaged in various epidemiologic research and intervention programs in this area.

Organization of Services

The health services system has a curative orientation and centers around hospital care. The development of

primary health care has not yet progressed much beyond the discussion stage, and most of the jurisdictions that have taken some action have organized "programs" of primary level care. Nevertheless, primary health care continues to be the basic strategy espoused by national, provincial, and municipal policies.

Currently, it is the provincial and municipal services that serve low-income groups not covered by social security, as well as those who are theoretically covered but whose access to services is limited for geographic or economic reasons. These services constitute the broadest and most extensive health service infrastructure of services in the national territory. Despite the crisis they are experiencing, the public services, which are provided free of charge, have had to respond to the increased demand created by the decline in the coverage of many social services, through a mechanism of public subsidy of the social security system.

The social security subsector, which is currently being restructured, includes about a dozen entities of differing institutional natures (associated with labor unions, state-run, semipublic, provincial, geared toward managerial personnel, etc.) and more than 300 entities that provide services to their affiliates in the various productive sectors, almost 85% of which are coordinated by the National Health Insurance Administration (ANSSAL). The remainder involves social security system entities for municipal and provincial public employees and for employees of the judicial branch, the legislative branch, the armed forces, and the police. It is estimated that this subsector covers 22 million people (about 74% of the national population), 18 million of whom come under the ANSSAL system. It has little infrastructure of its own and so contracts private providers (clinics, hospitals, pharmacies, physicians, etc.) for the delivery of almost all services, thus serving as a conduit for financing.

The private subsector is composed of two major groups: independent professionals who provide services to private patients affiliated with the social security system or a private prepaid health care system, and health care establishments (of varying sizes and capacities, levels of complexity, and economic power) under contract with the social security system. The subsector also includes nonprofit entities, such as certain hospitals in ethnic communities.

In recent years, prepaid health care organizations have grown in both number and importance. They are grouped under two trade associations: the Board of Medical and Health Care Institutions of Argentina and the Association of Prepaid Health Care Entities. The latter represents organizations that do not have their

own services. A survey carried out in 1989 found 79 prepaid health care organizations in the Federal Capital and 50 in greater Buenos Aires, with 1.5 million beneficiaries. In 1992, it was estimated that there were 240 such organizations throughout the country, with 2.5 million beneficiaries.

The Health Care Infrastructure

In 1986, the Department of Health reported that there were some 6,500 physicians' offices and outpatient facilities, 3,180 hospitals, and 147,000 hospital beds in the country. In 1990, the Program for Technical Assistance to the Social Sectors conducted a survey on use of services and spending on medical care for the Federal Capital and greater Buenos Aires. Health care establishments were studied according to the type of service provided (outpatient, inpatient, diagnostic and treatment, production, research, or regulation), type of establishment (public sector, private sector, or social security), and geographic location. Almost half the establishments were outpatient facilities (48%), followed by inpatient institutions (31%), and diagnostic and treatment facilities (19%). Most of this infrastructure is in the private sector (62% of the services), followed by the public sector (30%), with the social security system having the smallest proportion (7.4%).

With regard to the distribution of hospital beds, 44,300 are available in the metropolitan region. Two-thirds of these are for patients with acute problems. Of the latter, 58% are in the public subsector, 35% in the private, and 7% in the social security subsector. The public subsector has 53% of all the beds available for patients with acute conditions and 67% of those for patients with chronic conditions, while the social security subsector has only 9% of those for patients with acute conditions and the private subsector has the rest. No current, reliable, and disaggregated information is available on the production and the output of services at the national level.

Human Resources

Up to now, educational, medical care, and labor institutions have been the ones to set the criteria for the development of human resources.

As a consequence of the major macrostructural changes taking place in the country, significant changes also are occurring in medical practice as a response to the changes in the organization of medical

care. There is a strong trend toward specialization in all areas, owing to the incorporation of new technologies and their influence on the value placed on certain practices. At the same time, a decrease in the remuneration of health personnel is being observed, which has negative repercussions in terms of performance, increased dependency, multiple jobholding, underemployment, and unstable employment conditions.

Based on indirect information, consultations with professional associations and organizations, and some official and private projections, an estimated 90,000 doctors were practicing in 1992. They are unequally distributed geographically, both among and within regions and between urban and rural areas. The distribution of medical professionals by province has not changed significantly—since 1980, there have been no changes in the geographic location of new schools of medicine, and no new policies have been applied with a view to promoting or providing incentives for relocation of professionals.

This situation is due in part to the fact that the universities that train doctors are located in major urban centers (Buenos Aires, Córdoba, Mendoza, Rosario, La Plata, Tucumán, and Corrientes), which also offer the best opportunities for medical graduates, since most of the money in the country is concentrated in these areas and the different services at the various levels of complexity are more highly developed. As a result, new doctors can find work more easily, either on their own in private practice or in staff positions, an option that has opened up basically in the past few years. In addition, owing to the peculiarities of the structure of services, opportunities for the majority of medical residencies are concentrated in the major cities.

There is strong pressure to specialize, which starts during training and is reinforced by market conditions, the increasing use of complex technology, and the consequent reorganization of the services. Several studies⁶ have found a high degree of specialization in Argentina (50%–60% of all doctors). There are no complete and comprehensive data available on the number of physicians practicing in the various specialties, because there are several different certification mecha-

⁶See Belmartino S, Block C, Luppi I, Quinteros Z, Troncoso MC. *Mercado de trabajo y médicos de reciente graduación*. Buenos Aires: Pan American Health Organization; 1990 (Publication 14); Katz J, Muñoz A, Tafani R. *Organización y comportamiento de los mercados prestadores de servicio en salud. Reflexiones sobre el caso argentino*. Buenos Aires: Pan American Health Organization; 1988 (Publication 1); and World Bank. *Argentina: estudio sectorial sobre población, salud, y nutrición*. Washington, D.C.: World Bank; 1987.

nisms and no unified registry. Nevertheless, based on information from various associations and organizations of specialists, it is possible to derive some figures which, owing to the characteristics of the institutions from which they come, give an idea of the minimum numbers practicing in each area. A comparison of the estimated number of physicians indicated by data from the main specialties reveals that two out of every three physicians are specialists. The proportion is as high as 80% among doctors with more years of advanced training.

Regarding nursing, estimates made in 1989 by the National Department of Human Resources and PAHO, together with information from the Argentine Federation of Nurses, indicate that there are approximately 69,000 nursing professionals, 18,000 of whom are nurses (including university graduates), 26,000 are nursing auxiliaries, and 25,000 are practical nurses. Although the total number has increased about 5% over the last 3 years, this rate of growth has not been sufficient to keep pace with population growth during the same period. The number of nurses in the highest category—nurses with university-level training—appears to have decreased in absolute terms owing to better employment opportunities outside the country.

The shortage of nursing personnel has thus intensified, and the ratio of doctors to nurses has increased. The country has five doctors for every nurse, contrasted with the figure of three nurses per doctor considered to be acceptable. The number of nurses per 10,000 population in 1992 was 5.2.

The training of human resources in Argentina takes place in public and private universities and service institutions, and in centers offering technical training in the various health professions. Between 1991 and 1992, at a time when the rate of enrollment in institutions of higher learning was showing a downward trend, the opening of four new private schools was authorized. Two of these are now operating, and the others are expected to open their doors in 1994. Three are located in the Federal Capital and the fourth is in the province of Entre Ríos.

Nursing professionals and nursing auxiliaries receive training from 95 institutions, of which 21 are university-level, 45 are non-university institutions of higher learning, and 29 are operated by the Ministry of Education through the National Private Instruction Service. Training is based on non-integrated curricula that focus on curative aspects of medical practice and emphasize the biological components of health-disease processes, without considering the social factors associated with those processes.

Generally speaking, human resources training in Argentina can be said to be in a critical phase. Government funding has been severely curtailed in most of the universities and public institutions that train about 95% of all health professionals. Another obstacle to effective undergraduate training is the structural rigidity that characterizes academic institutions and prevents them from incorporating technological changes with the speed that their impact warrants, as well as the flood of associated information. As a result, it has become essential for medical personnel to pursue graduate studies in order to complete their professional training.

Environmental Services

In 1989, the Government promulgated a law on privatization, private investment, and public service concession. This measure led to major changes in water supply and wastewater disposal and treatment services in the Buenos Aires metropolitan region, where public services had been administered by a state-run company, Obras Sanitarias de la Nación (OSN).

With the privatization of OSN (under a 30-year concession to a private international firm for water supply and wastewater disposal), the regulatory and control functions previously exercised by OSN were transferred to the new Department of Natural Resources and Human Environment (SRNAH). This entity, created in 1991 within the framework of State reform, has formal authority to enforce regulations relating to development, protection, reclamation, and control of the environment and the conservation of natural resources. That same year, regulations were established that impose fines of up to US\$ 100,000 for direct or indirect contamination of waterways.

The country's institutional structure for responding to environmental problems is varied and fragmented. At the national level, in addition to the SRNAH, there are the Ministries of Health and Social Action, of Economy, of Interior, of Defense, and of Foreign Affairs, as well as the Department of Planning within the Office of the President, all of which have agencies that are directly concerned with the environment. Various provincial and municipal institutions also share very broad responsibility, because few functions were delegated to the central Government in this area. Consequently, the standards and procedures established at the national level are not always adopted by the provinces. Moreover, there are close to 700 non-governmental organizations in the country working to protect ecosystems and preserve the population's

quality of life, in addition to some 700 community organizations that are directly involved in securing water supply and wastewater disposal services for their respective populations.

Personal Health Care Programs

The reform of the State has led not only to the technical and political restructuring of the Ministry of Health and Social Action and the Department of Health, but also to a reorientation of the strategies and programs of the various technical units. In addition to setting policies and standards and regulating and controlling services (in the broad sense) and resources, provinces and municipalities also were given responsibilities for technical cooperation. As a consequence of the overall strategy of decentralization, provincial units responsible for health programs have acquired greater vitality and importance.

One of the main programs is the maternal and child health program. A national commitment to maternal and child health has been established, which sets national goals and strategies and for which action by the provinces is essential. There also has been a significant increase in national funds for the execution of provincial programs, which are gradually stepping up their level of activity.

With external financing, a maternal and child health and nutrition program is being carried out with a view to developing and improving a network of comprehensive care services and programs at the primary level. The program's strategy involves focusing on socioeconomic risk groups; this effort is expected initially to cover 25% of the provincial jurisdictions.

The immunization program reached high levels of coverage and surveillance for the EPI vaccines and improved the coordination of its efforts with those of the provincial programs. The program is carrying out a national campaign to eliminate measles.

Other noteworthy programs at the national and provincial levels are the AIDS and cholera control programs. The occurrence of cholera cases during 2 consecutive years gave rise to an intensive mobilization effort to address the situation. Programs were established for public information, health education, personnel training, and staffing of services, and in the affected areas (mainly the northeastern and northwestern regions), investments in basic sanitation were made.

Almost all the provinces are collaborating in the national AIDS control program, which supports and car-

ries out efforts to improve diagnostic laboratories, medical care for AIDS patients, and information and education programs for the general public and for specific risk groups. There is also intensive involvement by nongovernmental organizations and interest groups, which are carrying out independent activities and support programs.

Drugs and Biologicals

Spending on drugs in Argentina is high (US\$ 38 per capita, according to information from 1985). In 1985, there were 13,400 registered drugs, and 1,500 of them were being marketed under 3,400 different names. At the fifth Argentine Congress on Drugs (1990), per capita spending on drugs was reported to be US\$ 80.

A decree was recently promulgated that regulates the prescription of drugs by their generic name and is intended to promote greater transparency and competition in the drug market in order to make drugs more affordable for the population. With intensive negotiation and reformulation of standards, headway has been made toward establishing a new national registry, which includes 8,000 drugs and provides for compulsory generic labeling. At the same time, an agency was created and put into operation to monitor and regulate the quality of drugs, chemicals, reagents, diagnostic and treatment materials, foods, and hygiene and cosmetic products. This agency is also responsible for monitoring the effectiveness and adverse effects of drugs, foods, and other products, as well as for regulating medical technology.

Health Research

Argentina has a long tradition of health research, especially in the biomedical area, and was one of the first countries in the Region to organize a State entity for the promotion and development of scientific activity. However, according to a recent study, the research situation appears to be deteriorating.⁷

In the years that have elapsed between the first national survey of scientific and technical resources

⁷Novick M, Sonino S, Bianchi E. *La investigación en salud en la Argentina*. Buenos Aires: Pan American Health Organization; 1993 (Publication 36).

(1969) and the latest survey (1988), both the number of people engaged in health research and the number of research projects have decreased, although health research continues to constitute 30% of all scientific research. Most research units are affiliated with the State (most are within universities), with little participation by the private sector. Most health research takes place in the Federal Capital and greater Buenos Aires (60% of the research units), followed by Córdoba and Cuyo.

Of all the research conducted, 70% is in the field of biomedicine and 10% in chemistry. The social sciences account for only 2% of research projects, although 4% of the investigators have a social science background. Between 25% and 30% of all studies have to do with diseases—especially neoplasms, diseases of the digestive system, and parasitic diseases (90% of the latter concern Chagas' disease)—25% with biology (cellular and molecular studies), 18% with technical issues, and 11% with public health.

BAHAMAS

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

General Conditions

The Commonwealth of the Bahamas is an archipelago of some 700 islands and cays scattered over almost 80,000 mi² in the Atlantic Ocean. The land area of the islands totals 5,382 mi². About 29 of the islands are inhabited. The wide geographic dispersion presents many logistical problems for the organization and delivery of services.

The census of 1 May 1990 recorded a population of 255,095. Over two-thirds (67.4%) of the people live on the island of New Providence, which has a population density of over 2,000 persons per square mile and which is the site of the capital city, Nassau. An additional 16% reside on Grand Bahama (with a density of about 77 persons per square mile), which contains the nation's second largest city, Freeport. The remaining population lives throughout the other islands, known collectively as the Family Islands.

Between 1980 and 1990, the urban population (defined loosely as that of New Providence and Grand Bahama) increased by 2.35% annually, while the overall population increase was 1.97%. There was virtually no growth (0.28%) in all the Family Islands combined, and in specific ones population actually decreased.

According to the 1990 census, 32% of the population is under the age of 15 years and 63% is between 15 and 64 years of age.

As an independent unitary state within the British Commonwealth of Nations since July 1973, the Bahamas is governed as a parliamentary democracy based on the Westminster/Whitehall model. Its Parliament comprises a Governor General, who represents the Government of the United Kingdom; a bicameral legislature including an elected House of Representatives; and an independent judiciary. The Cabinet of Ministers is the executive arm of the Government and is headed by the Prime Minister, who is also a member of the legislature. Government programs are carried

out by ministries—each headed by a Minister (political) and a Permanent Secretary (administrative)—as well as by quasi-governmental institutions.

There was a change of government (the first change in 25 years) as a result of the general elections held in August 1992.

The gross national product (GNP) per capita in 1991 was US\$ 10,965 (the currency exchange rate is B\$ 1.00 to US\$ 1.00). Contributing to this figure is the income of a relatively small number of extremely wealthy persons. The gross domestic product (GDP) has been increasing steadily.

Tourism and tourism-related commerce constitute by far the main economic activity, with more than 3 million tourists visiting the country annually. Tourism accounts for about three-quarters of the GDP. Service industries (including government services, tourism, banking, and insurance), fishing, and agriculture employ approximately 80% of the eligible labor force.

The economic crisis of the early 1990s has aggravated unemployment, and labor absorption in other activity areas is limited. Preliminary results from the 1992 labor force survey estimate the unemployment rate for all the Bahamas to be 14.8%, up from 12.2% in 1986. The unemployment rate in New Providence was estimated at 14.3%, a notable increase over the 11.3% calculated in 1991. In Grand Bahama, the unemployment rate rose from 13.4% in 1991 to about 16.8% in 1992, the highest figure recorded in recent times. In the Family Islands, economic activity is generally low and is based primarily on farming and fishing.

About 16% of government resources were allocated in 1991 for the health system; the national health expenditure by government that year was US\$ 90.5 million, approximately 3.2% of the GNP. In 1988, national expenditure for health was US\$ 74.6 million, which represented 14.6% of the national budget.

Health Overview

Life expectancy at birth has improved steadily. Current estimates indicate a life expectancy at birth of 76 years for females and 69 years for males. Ten years

ago, life expectancy at birth was 66 years for males and 74 years for females.

During 1991 a total of 1,319 deaths were registered in the Bahamas. The crude death rate was 5.1 per 1,000 population, compared with 5.9 in 1989 and 5.3 in 1990. Longer term trends indicate a general decline in the crude death rate of about 25% from the 1970s to the present.

Over the last two decades, infant mortality has shown some improvement, moving from just below 35 deaths per 1,000 live births in the 1970s to around 20 per 1,000 in recent years.

The number of infant deaths recorded in 1991 was 122, for an infant mortality rate (IMR) of 19.7 per 1,000 live births. This is well below the highest rate in recent years (30.2 in 1986). The lowest IMR was recorded in 1989 (18.1 per 1,000 live births). In 1990, the perinatal mortality rate (PMR) was 19.3 per 1,000 births, while the neonatal mortality rate (NMR) was estimated at 16.0 per 1,000 live births. There was a decline in both of these rates in 1991, to 15.8 and 14.4 for PMR and NMR, respectively.

An estimated 6,192 live births occurred in 1991, for a crude birth rate of 23.6 per 1,000 population. This represents a decline over the last 3 years. Table 1 summarizes these and other vital rates for the 8-year period 1984–1991.

Vital Statistics System Coverage and Data Quality

The registration of births, deaths, and marriages in the Bahamas is required by law. The statutes require that births be registered within 21 days of the event. A Medical Certification of Death (with details of direct and underlying causes) must be completed by a physician and submitted to the Registrar of Deaths before burial can occur. This office registers the death and issues a death certificate. Exceptionally, in remote areas where a physician may not be present, a nurse may certify the death (coroners' cases do not fall in this category).

An ongoing assessment of the coverage of the birth registration system is possible because the birthing facilities throughout the country, including public and private hospitals and clinics, routinely provide the Ministry of Health and the Environment with reports of all births occurring in their establishments. These reports serve as the basis for calculating the actual total number of births.

This process reveals an underregistration of around 18% each year, allowing for necessary adjustments to be made to the basic health indicators that are derived from birth data, such as neonatal and infant mortality. Studies indicate that no more than 1% of the births in the country occur outside a health facility without the

TABLE 1
Summary of vital events, rates, and natural increase, Bahamas, 1984–1991.

| | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991* |
|-------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Mid-year population estimates | 226,000 | 232,000 | 236,171 | 240,344 | 244,611 | 248,933 | 255,295 | 259,000 |
| Live births | | | | | | | | |
| Registered live births | 5,177 | 5,584 | 4,770 | 4,331 | 4,943 | 5,012 | 5,035 | 5,124 |
| Estimated late registration | 575 | 741 | 1,021 | 1,108 | 804 | 1,128 | 1,082 | 1,068 |
| Estimated total live births | 5,752 | 6,325 | 5,791 | 5,439 | 5,747 | 6,140 | 6,117 | 6,192 |
| Crude rate/1,000 population | 25.5 | 27.3 | 24.5 | 22.7 | 23.5 | 24.7 | 24.0 | 23.9 |
| Deaths | | | | | | | | |
| Number | 1,150 | 1,341 | 1,407 | 1,376 | 1,319 | 1,459 | 1,343 | 1,319 |
| Crude rate/1,000 population | 5.1 | 5.8 | 5.9 | 5.7 | 5.4 | 5.9 | 5.3 | 5.1 |
| Natural increase | | | | | | | | |
| Number | 4,602 | 4,984 | 4,384 | 4,063 | 4,428 | 4,681 | 4,774 | 4,873 |
| Crude rate/1,000 population | 20.4 | 21.5 | 18.6 | 17.7 | 18.1 | 18.8 | 18.7 | 18.8 |
| Infant deaths | | | | | | | | |
| Number | 116 | 147 | 175 | 123 | 106 | 111 | 149 | 122 |
| Rate/1,000 live births | 20.2 | 23.2 | 30.2 | 22.6 | 18.4 | 18.1 | 24.4 | 19.7 |
| Perinatal mortality rate | 18.8 | 23.7 | 27.6 | 24.8 | 16.7 | 16.4 | 19.3 | 15.8 |
| Neonatal mortality rate | 13.4 | 17.4 | 21.8 | 16.2 | 12.4 | 9.0 | 16.0 | 14.4 |

*Figures for 1991 are preliminary.

Note: All rates relative to live births have been calculated based on the estimated number of live births.

Source: Department of Statistics, Ministry of Finance.

knowledge or attendance of trained health workers, who report all known births to the ministry.

Population

The total fertility rate (per woman) is estimated at 2.1. Comparisons of recent age-specific fertility rates with those in the 1970s and 1980s show that fertility is lower now among all age groups except 35–39-year-olds. In 1983, for every 1,000 women 30–34 years there were about 92 live births, and in 1991 the number was 87. Among 35–39-year-olds, the figures were 39.4 per 1,000 in 1983 and 45.6 per 1,000 in 1991.

Teenage pregnancy is a continuing problem. Statistics are based on live birth data alone, since complete data on abortions are not available. About 14% of all births in the Bahamas are to mothers under 20 years of age. Between 1988 and 1991 there were 53 live births to girls under 15 years old. The seven births to mothers under 15 years in 1991 equaled 0.1% of all births that year, for a birth rate of 0.5 per 1,000 females 10–14 years. For the most part, teenage birth rates were highest in New Providence, although in the early 1970s and again since 1986 the rates in Grand Bahama were equal or greater.

Mortality

There were 1,319 deaths during 1991 (preliminary data), 1.7% of which were assigned to ill-defined causes. The leading defined cause of death in the general population was diseases of the heart, with a rate of 94.3 deaths per 100,000 population (246 deaths). Second was cancer, with a rate of 78.5 per 100,000 (205 deaths). AIDS and AIDS-related complex was the third leading cause; the 126 deaths from this disease in 1991 translate to a rate of 48.3 per 100,000. The cause group accidents and violence ranked in fourth place as a cause of death, with a rate of 47.9 per 100,000 (125 deaths). Diabetes mellitus ranked fifth (29.5 per 100,000; 77 deaths) and cerebrovascular diseases, sixth (28.4 per 100,000; 74 deaths).

Significant differences exist between males and females in the mortality levels and the ordering of principal causes of death. The 736 male deaths in 1991 yielded a death rate of 580.0 per 100,000 males in the population, while the female death rate was 441.3 per 100,000 (583 deaths). Diseases of the heart and external causes (accidents and violence) were the two most important groups of causes of male mortality in 1991, accounting for 133 and 105 deaths, respectively; the leading causes

among females were diseases of the heart and malignant neoplasms, which accounted for 113 and 104 deaths, respectively. The biggest differences were for accidents and violence, which did not figure among the 10 leading causes of death in females; chronic liver disease and cirrhosis, which was likewise outside the top causes in females but ranked tenth among males; and diabetes mellitus, which ranked third for females (51 deaths) but eighth for males (26 deaths).

Morbidity

Normal delivery (ICD-9, 650) is the foremost single reason for admission to the general hospitals and is excluded from the analysis of hospital morbidity patterns. In 1991 at the Princess Margaret Hospital (the major public institution, serving over 80% of the population) there were 17,903 total discharges, of which 16.5% followed normal delivery. The leading cause of inpatient morbidity is complications of pregnancy, childbirth, and the puerperium (640–648, 651–676). In 1991 there were 1,826 discharges due to this cause group (over 10% of all discharges). The second leading morbid condition requiring hospitalization was the aftermath of accidents and violence, with 1,316 discharges (7.4%). Of these, 71.4% were males. The age group with the greatest contribution was 15–24-year-olds with 418 discharges, 339 (81%) of males and 79 (19%) of females. Table 2 shows the other leading causes of inpatient morbidity at Princess Margaret Hospital in 1991 and at Rand Memorial Hospital in 1990. Rand Hospital serves about 16% of the population.

Information on length of stay sheds further light on the picture of hospital morbidity. It is notable, for instance, that while patients whose primary diagnosis was complications of pregnancy, childbirth, and the puerperium ranked first in admissions, they had an average length of stay of 1 day. In contrast, the average length of stay of patients diagnosed with cerebrovascular disease (which ranked 19th) was 15 days.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

Infants. The regional goal for infant mortality by the end of the century is 30 deaths or less per 1,000 live births. In 1991 the rate in the Bahamas was 19.7 per 1,000 live births. Although the infant mortality rate is

TABLE 2
Leading causes of inpatient morbidity, with number and percentage of the total for all causes, Princess Margaret Hospital (PMH) and Rand Memorial Hospital, Bahamas, 1990 and 1991.

| Principal causes | PMH (1991) | | | Rand (1990) | | | Both hospitals | | |
|---|------------|--------|-------|-------------|--------|-------|----------------|--------|-------|
| | Rank | Number | % | Rank | Number | % | Rank | Number | % |
| Complications of pregnancy, childbirth, and puerperium (640-648, 651-676) | 1 | 1,826 | 10.2 | 1 | 536 | 11.7 | 1 | 2,362 | 10.5 |
| Accidents and violence (E800-E999) | 2 | 1,316 | 7.4 | 2 | 276 | 6.0 | 2 | 1,592 | 7.1 |
| Pneumonia and influenza (480-487) | 3 | 718 | 4.0 | | 81 | 1.8 | 3 | 799 | 3.6 |
| Bronchitis, emphysema, and asthma (490-493) | 4 | 580 | 3.2 | | 60 | 1.3 | 5 | 640 | 2.8 |
| Diseases of the female genital organs (610-629) | 5 | 473 | 2.6 | 5 | 169 | 3.7 | 4 | 642 | 2.9 |
| Diseases of the heart (390-429) | 6 | 471 | 2.6 | 9 | 98 | 2.1 | 8 | 569 | 2.5 |
| Abortion (630-639) | 7 | 464 | 2.6 | 7 | 123 | 2.7 | 7 | 587 | 2.6 |
| Diseases of other parts of the digestive system (530-549, 555-569) | 8 | 454 | 2.5 | 3 | 177 | 3.9 | 6 | 631 | 2.8 |
| Intestinal infectious diseases (001-009) | 9 | 388 | 2.2 | 10 | 86 | 1.9 | 9 | 474 | 2.1 |
| Certain causes of perinatal morbidity (760-779) | 10 | 385 | 2.2 | | | | | | |
| Diseases of the upper respiratory tract (460-465, 470-478) | | 284 | 1.6 | 4 | 176 | 3.8 | 10 | 460 | 2.0 |
| Mental disorders (290-319) | | | | 6 | 151 | 3.3 | | | |
| Diabetes mellitus (250) | | 246 | 1.4 | 8 | 118 | 2.6 | | 364 | 1.6 |
| Total, 10 leading causes | | 7,075 | 39.5 | | 1,910 | 41.7 | | 8,756 | 39.0 |
| Normal delivery | | 2,946 | 16.5 | | 597 | 13.0 | | 3,543 | 15.8 |
| Total admissions | | 17,903 | 100.0 | | 4,575 | 100.0 | | 22,478 | 100.0 |

below the global and regional goals advanced by PAHO/WHO, there is deep concern in the Bahamas over the difficulty encountered in bringing this indicator closer to the levels found in some of the more industrialized nations.

The leading causes of death in children under 1 year of age in 1984, 1989, 1990, and 1991 were certain conditions originating in the perinatal period, which ranked first in each of those years; congenital anomalies, which ranked second beginning in 1989; pneumonia, which was the second leading cause of infant deaths in 1984, dropped to third place in 1989 and 1991, and ranked fourth in 1990; and intestinal infectious diseases (ICD-9, 001-009) and "other" bacterial diseases (020-041), which were the third cause in 1990. AIDS and AIDS-related complex occupied fifth place in 1989 and 1990 and fourth place in 1991. As data for 1989 illustrate, approximately 85% of infant deaths result from the top five causes: conditions originating in the perinatal period (45%), congenital anomalies (16%), pneumonia (12%), external causes (6%), and AIDS (5%).

In 1991, gastroenteritis was the most frequently reported infectious disease in males and females under the age of 1 year. The other leading causes were ame-

biasis, influenza, and chickenpox, although the rank order was slightly different in males and females. In addition, five cases of AIDS were reported for females in this age group.

The Health and Nutrition Survey (1988-1989) found that approximately two-thirds of all mothers at least made an attempt to breast-feed, but that over 80% of them introduced a bottle as early as the first week of life. In addition, bottle-feeding was introduced prior to discharge to over 90% of infants delivered in hospitals. Even partial breast-feeding was discontinued by the seventh week of life among almost half of the infants (47.7% overall). Only about 14% breast-fed beyond 12 weeks of age.

It is estimated that approximately 9.8% of full-term infants born in the Bahamas are of low birthweight (i.e., less than 2,500 g at birth). The problem of low birthweight is greatest in Grand Bahama and least severe in the Family Islands.

Children 1-4 Years Old. Based on mortality data, the leading health problems of pre-school-age children include AIDS and its related disorders, and accidents and violence. Of the 14 deaths in 1991, these two causes accounted for 4 and 2, respectively. In 1990, of

the 21 deaths in children 1–4 years, 7 were due to AIDS and 6 were due to external causes.

The regional goal for mortality in the 1–4-year age group by the year 2000 is no more than 2.4 deaths per 1,000 population in that age group. In 1991 this indicator stood at 1.3 per 1,000 in the Bahamas.

Diarrheal diseases among children under 5 years of age continue to be an area of concern. Peak numbers of cases were reported in 1989 (2,080 cases) and 1991 (2,025 cases), up from 1,095 cases in 1988 and 1,730 cases in 1990. Fortunately, the problem has been limited to morbidity: there was one death due to other and ill-defined intestinal infections (ICD-9, 007–009) in 1991 and none in 1990. Historically, intestinal infectious diseases account for 10%–15% of all admissions of children under 5 years old to the Princess Margaret Hospital.

The country's participation in the regional program initiated in 1990 for the elimination of measles (using the measles-mumps-rubella [MMR] combination vaccine) has clearly had a positive local impact. No cases of this disease were reported in 1991. The last measles epidemic was in 1983. Since then, the highest number of cases (82) was recorded in 1986 and the lowest number (22) in 1988.

There was an outbreak of rubella in 1990, when 121 cases were notified, whereas in 1989 and 1991 five cases were reported each year. Mumps was a problem in 1985, but since then the number of cases brought to the attention of officials has been relatively low: 34 in 1991, 18 in 1990, and 13 in 1989.

During the period 1982 to 1991, no cases of diphtheria, polio, or neonatal tetanus were reported.

The coverage rates for DPT vaccine increased from 86% in 1989 to 92% in 1991 and 1992. Polio vaccine and MMR followed this same pattern, and in 1992 their coverages were estimated at 92% and 94%, respectively.

Children 5–14 Years Old. During 1991 a total of 20 deaths occurred in this group, one less than the 1990 total of 21 deaths. The leading cause of death in this age group was the category accidents and violence, accounting for 7 deaths during 1991 and 12 in 1990. Anemia and pneumonia (3 deaths each) were the other significant contributors to the 1991 total.

The principal infectious diseases affecting both sexes in this age group in 1991 were chickenpox, influenza, amebiasis, and mumps. This group contained the largest proportion of reported cases for both chickenpox (33.2%) and mumps (50.0%).

Respiratory system problems constituted the most common ailment in school-age children visiting the community clinics in 1991 (8,805 visits), followed by

skin problems other than scabies or ringworm (4,095 visits), and injuries and accidental poisonings (2,555 incidents).

Adolescent and Adult Health

The leading causes of death for young men 15–24 years of age in 1991, were similar in both 1990 and 1991 and included deaths due to accidents and violence (60%), AIDS (7.5%), and pneumonia (5%). Among females aged 15–24 in the same year, AIDS, accidents and violence, and diseases of the musculoskeletal system and connective tissue accounted for over 47% of the deaths.

Among males 15–44 years of age, there were 180 deaths, 4 of them from ill-defined causes. The top two causes of death were external causes (58 deaths or 33% of the deaths from defined causes in this age group) and AIDS and AIDS-related complex (51 deaths or 29.0% of the deaths from defined causes). Diseases of the heart ranked third (nine deaths). There were seven deaths due to pneumonia and seven deaths due to the cause group other diseases of the digestive system, to round out the five leading causes of death. Among females in this age group, there were 103 deaths, 1 of them from ill-defined causes. AIDS ranked first (24 deaths or 23.5% of deaths due to defined causes); malignant neoplasms were the second leading cause of death (15 deaths or 14.7%), followed by external causes (10 deaths), other diseases of the digestive system (7 deaths), and other diseases of the respiratory system (7 deaths).

The main infectious diseases reported among those in the 15–44-year age group are influenza, tuberculosis, viral hepatitis, syphilis, gonococcal infections, and AIDS. For both gonorrhea and syphilis, two of the more commonly reported diseases, incidence rates have decreased over the last decade, although syphilis showed a transient increase between 1987 and 1989. In addition, a significant number of chickenpox cases are still reported among this age group.

The prevalence of hypertension in the 15–64-year age group is about 15% in males and around 12% in women.

Health of the Elderly

The death rate among the elderly (65 years of age and over) is about 6 per 1,000 elderly population. The life expectancy at age 65 is estimated at 15 years for males and 18 years for females. Among the elderly

there is little difference between the sexes with regard to causes of mortality.

The dominant causes of mortality in persons 65 years and older are chronic diseases. Based on 1991 figures, the leading cause of death, accounting for 28.3% of the deaths in persons 65 and over, was diseases of the heart, followed by malignant neoplasms (21.8%). Diabetes mellitus (9.7%) and cerebrovascular disease (9.6%) ranked third and fourth. Pneumonia, a disease that opportunistically attacks the immunocompromised and the elderly, ranked fifth and accounted for 5% of all deaths among persons in this age group. Deaths due to accidents and violence—a cause group that consistently ranks in the top five for deaths among all other age groups combined—accounted for 2.1% of the deaths in this group and was ranked seventh.

Ischemic heart disease, hypertensive disease, and diseases of pulmonary circulation were the major causes of death from heart disease in this group. Malignant neoplasms of the digestive organs and peritoneum, of the genitourinary organs, and of the prostate were the leading causes of cancer death.

Workers' Health

Data from New Providence, where over 67% of the population resides, indicated a total of 583 reported accidents in the working population in 1989. The majority of these were accidental falls (32.6%), accidents due to natural and environmental conditions (30.9%), and injuries caused by machinery and by cutting and piercing instruments (22.0%).

Of every 100 reported work-related injuries, 63 affected males. The proportion of males was even higher for injuries due to machinery and cutting and piercing instruments (80.5%), accidents due to natural and environmental factors (71.7%), injuries inflicted by other persons (75%), and transport accidents (71.4%). The only category where the majority (62.1%) of the reported incidents occurred among females was accidental falls.

The under-30 age group accounted for 44% of all accidents, with only 13.9% occurring in the oldest grouping, those workers aged 50 years and over. No detailed data are currently available on the nature of the work that led to accidents, but a breakdown by kind of industry is as follows: 25.6% of the reported accidents affected those employed in the hotel industry, 19.9% those employed by the Government, and 12.0% those employed in the construction industry.

Health of Special Groups

The illegal immigration of Haitian refugees is a difficult issue for the Bahamas. Estimates of the numbers of Haitians living in the country range from 20,000 to 40,000. Their economic and social impact is far-reaching for the Bahamas. The effects of the immigrants on health conditions in the country are primarily related to their contribution to infectious diseases and their general demands on the health services. In general, this group is plagued by substandard housing and living conditions, with the attendant social and health risks.

With regard to the first point, it has been noted that of malaria, tuberculosis, typhoid, AIDS, and hepatitis B cases notified within the Bahamas between 1984 and 1992, Haitian nationals comprised 71%, 32%, 32%, 23%, and 10%, respectively.

Health services utilization data for 1992 indicate that individuals documented as being of Haitian origin made up a significant proportion of the persons receiving care at government facilities: for example, 18.6% and 16.4% of all visits to the child health and the antenatal clinics, respectively, at the Blue Hill Road Health Center, and 51.2% of the total new clients registered in the child health services section of the Flamingo Gardens Clinic.

Diseases and Health Impairments

HIV Infection and AIDS

HIV infection and AIDS have a significant impact on the Bahamas. The reporting of AIDS began in 1985 and by 31 December 1992 a total of 1,093 cases had been notified, 665 among males and 428 among females, for a male:female ratio of 1.6:1. The 15–59-years age group accounts for 83.4% of the cases, with 67.2% of the cases occurring in the 15–44 portion of this age group. A further 3,155 individuals are known to be HIV positive, but so far have not developed full-blown AIDS.

The disease occurs primarily among heterosexual adults (63%) and next most commonly among children (16%). Bisexuals and homosexuals account for only 6% and 2% of the cases, respectively. At the start of the epidemic, as many as 70% of the persons in the country identified as HIV positive were non-Bahamians (mostly illegal immigrants). The increasing spread of the virus has changed the percentage distribution among Bahamians and non-Bahamians. Immigrants now constitute 23% of the cases and known healthy

carriers—a lower, but still significant, contribution to the problem. Free-base/crack cocaine addicts (i.e., non-intravenous cocaine users) represent a core group (33%) of individuals with HIV infection and AIDS.

A seroprevalence study conducted in 1992 found that about 3 of every 100 prenatal patients are HIV positive.

Injuries

Injuries (intentional or unintentional) rank high as causes of premature death in the overall population and in all population groups. The problem is most significant among men, particularly those in the 15–44 age group, and among children 5–14 years of age. About one-third of all the deaths of men 15–44 years old were due to accidents or violence. It is estimated that injuries from all causes account for 3,200 years of potential life lost annually in the Bahamas.

More than 1,500 persons are admitted to Princess Margaret and Rand Memorial hospitals each year because of injuries. Injuries were the second leading cause of admission to Princess Margaret Hospital (in 1991) and Rand Memorial (in 1990) (see Table 2) and were outranked only by pregnancy-related illnesses.

The leading cause of the injuries admitted to hospital and of injuries resulting in death is traffic accidents. They account for 30% of all injury-related hospital admissions and 25% of all injury-related deaths.

Annually, over 53,000 patients are treated at the Accident and Emergency Department of Princess Margaret Hospital. It is estimated that over 37% of these visits are due to accidents and violence.

Substance Abuse

Alcoholism and drug abuse, the latter particularly among young people, are major health problems. The number of new cases of crack cocaine abuse presenting for treatment at the community mental health clinic (the principal outpatient treatment facility in the country) has been declining since 1987. However, the decline in hospitalized cocaine abuse cases has not been as consistent.

The prevalence of substance abuse has been estimated for the general population and for selected population groups, including secondary school students, in drug use studies carried out between 1988 and 1991. The studies show, for example, that 5.7% of adults

have used cocaine at least once in their lives. In young males (18–29 years) the prevalence of ever having used cocaine was as high as 15.9%. Among secondary students, 1.7% had used cocaine, 8.2% had used marijuana, and 66.0% had used alcohol at least once in their lives.

Chronic Noncommunicable Diseases

Diseases such as hypertension, diabetes, heart attack, stroke, and cancer are among the leading causes of mortality, accounting for nearly 45% of all deaths in the country. In terms of morbidity, more of the population is affected by these diseases than by any other group of problems.

As a result of the National Health and Nutrition Survey, it is now known that one out of every four adults (15 years or over) in the Bahamas is classifiable as frankly obese, and obesity is a potent predisposer to the conditions named. The prevalence of high blood pressure is as high as 13% in persons 15–64 years old and 38% in the elderly. Diabetes is present in over 11% of the 15–64-year age group in New Providence.

Infectious Diseases

As stated previously, the last measles epidemic was in 1983. Since then, the number of cases reported annually has ranged from highs of 82 cases in 1986 and 72 cases in 1990 to lows of 26 cases in 1985 and 22 cases in 1988. No cases of measles were reported in 1991.

The highest number of tuberculosis cases reported during the past 8 years, 71, occurred in 1986. From 1987 to 1991 inclusive, there were 39, 51, 52, 46, and 53 cases of tuberculosis reported annually.

Gastroenteritis in children under 5 years old continues at high levels, with the number of reported cases fluctuating from year to year. Between 1987 and 1991 the numbers were 1,925, 1,095, 2,080, 1,730, and 2,025.

During May and June of 1991, a local outbreak of *Vibrio parahaemolyticus*-related illness occurred in New Providence. As many as 380 cases were reported in 1 week at the height of the outbreak. This illness was primarily associated with the consumption of raw conch obtained from wet storage sites in Nassau Harbor and was linked to the food handling practices of the vendors in that area, combined with the sanitary conditions of the area itself.

Risk Factors

Natural Disasters

Hurricane Andrew, which hit the Bahamas in late August 1992, caused extensive damage. The areas of North Eleuthera, Harbour Island, Spanish Wells, Bimini, and the Berry Islands, with a total estimated population of 6,170, were hardest hit. The economic toll of this disaster is difficult to estimate. The human toll included three deaths, two hospitalizations, and a number of minor injuries as a direct result of the storm.

The hurricane caused widespread contamination of water supplies. Throughout the period of contamination, the population in these areas was provided with bottled water for drinking and was instructed to boil water for all other household uses. Concentrated efforts at insect spraying were made. Fortunately, no illnesses resulted from water or food contamination. The mental health effects have not been evaluated.

Cigarette Smoking

Tobacco is neither grown nor processed in the Bahamas. Cigarettes are imported for local consumption and for extensive duty-free sales to tourists.

No laws restrict tobacco-product advertising in the Bahamas, and tobacco companies commonly support sporting events. By law, tobacco-product advertising in printed or electronic media must include a health warning.

It is estimated that about 20% of males in New Providence and 14% of those in Grand Bahama can be classified as current regular smokers. Current smoking rates among women are significantly lower (4.1% and 3.3% in the respective areas).

Lung cancer accounts for about 12% of the total deaths due to malignant neoplasms in the country. The age-specific lung cancer mortality rate has been consistently higher for men than for women.

Obesity

The National Health and Nutrition Survey (1988–1989) revealed that about 6.7% of children 5–14 years old were obese (based on body mass indices and U.S. reference standard tables, using a cut-off point of the 95th centile). Obesity was particularly prevalent among females between the ages of 10–14 years resid-

ing in New Providence, where as many as 16% were found to be obese.

Obesity is documented as a major nutritional problem among the Bahamian adult population. Overall, 21.3% of the population 15–64 years old was obese. The problem is more common in females than males. While the differences in the prevalence of obesity among the three locations (New Providence, Grand Bahama, and the Family Islands) are not significant, the pattern that emerges suggests that for males the problem of obesity is more common in urban areas, while the opposite trend is true for females.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

The Bahamas subscribes to the internationally accepted principle that health is a fundamental human right and not a privilege. There is also full commitment to the global goal of "health for all by the year 2000," and the concept of community participation is accepted as a vital element of the health philosophy.

The Ministry of Health's policy document, originally drafted as a dynamic tool in 1980 and most recently revised in 1988, is automatically scheduled for review and revision. But this process will receive even higher priority as a result of the recent change in government.

The published *Manifesto* of the new Free National Movement Government, prepared for the election campaign, establishes broad health targets.

The following list details the steps taken since 1988 to fulfill the nation's health goals and implicit health objectives:

- The Dental Health Bill was passed in 1989 and review of other legislation continues. A dental council has been established.
- Eight modern primary care health centers have been constructed and opened: three in New Providence and five throughout the Family Islands. In addition to maternal and child health services, the New Providence facilities are offering—for the first time at the community level—ambulatory services for the general public.
- A major project for the improvement of the health care delivery system was undertaken from 1988 to 1990. One of the components of the project was institutional strengthening, which included policy formulation, planning, and programming; organization and

management reforms; health care cost recovery; cost accounting systems; human resource development plans; management information systems; supply management systems; maintenance management systems; and health legislation.

- The establishment of local government has begun. The new Government has already initiated efforts to create both a licensing authority and a road traffic authority in a number of Family Islands, commencing in January 1993.

- In 1991/1992, the Ministry of Education implemented a comprehensive family life education program in the primary and secondary school curricula, an important health promotion strategy that promises to have significant impact over time.

- The National Health and Nutrition Survey was completed in 1989. The results indicate a number of areas of concern and provide direction for programming. They also supply a baseline for monitoring and evaluating health initiatives and for describing the health status of the nation.

- A National Coordinator for Disaster Preparedness has been identified, and work is proceeding toward the implementation of a comprehensive national disaster preparedness plan.

- As one of the outcomes of a staff training needs assessment exercise started in 1991, the Ministry of Health and the Environment has committed itself to the establishment of a Human Resource Development Unit. A core group responsible for drafting development plans for the unit and for providing input to the ongoing training recommendations of the Ministry has already been established.

- In response to growing dissatisfaction with the unavailability and high cost of pharmaceuticals, the Ministry of Health and the Environment completed a study in January 1992 of pharmaceutical selection and procurement. As a result, the formulation, adoption, and implementation of an essential pharmaceuticals list for the public sector was undertaken, and a revision of the current pharmaceutical formulary is under way.

- The country has been grappling with the definition of alternative ways to finance health care. The main recommendation has been for the establishment of a national health insurance plan.

Other social programs with an impact on health include the consumer subsidies available through the Department of Social Services. Unemployment assistance provides a cash allowance to qualified unemployed persons for a specified period to help them afford basic necessities while they are seeking other

employment. A food allowance provides permanent monthly food coupons to certain retirement pension recipients and disabled persons. Other categories of persons may also be eligible for the food allowance. Such grants range from US\$ 10 to US\$ 40 per month, as the circumstances dictate.

The Government sponsors a school feeding program for selected underprivileged children in Government-owned schools. Under this program, certain needy children are provided with a daily lunch at no cost.

The Bahamas has well-developed regulations in the ministries responsible for health and agriculture which address food handling, preparation, and processing. These regulations are contained in the following legislation: the Food Act, the Environmental Health Act, and Food Regulations to Health Services Act.

The promotion of proper health practices, including good nutrition and regular exercise, has been given high priority by the Ministry of Health and the Environment. It is the chief strategy for preventing and reducing the impact of hypertension, diabetes, and atherosclerosis.

Organization of Services

Personal Health Care Services

The public sector operates three hospitals, two of which are located in New Providence. They are the Princess Margaret Hospital (PMH), with 462 beds, providing general acute care and a wide scope of specialized services; and the Sandilands Rehabilitation Center (SRC), with 457 beds, providing both psychiatric and geriatric care. The third institution, the Rand Memorial Hospital (Rand), is in the nation's second largest city, Freeport, on Grand Bahama. It provides general acute care and limited specialized services and has a bed complement of 78. Both general hospitals provide a wide range of diagnostic and therapeutic services.

The occupancy levels of the Princess Margaret Hospital are high and increased annually from 1988 to 1991, reaching 87.4% in the latter year. The Rand Memorial Hospital had an occupancy level of at least 62% in the period 1988–1991, and the psychiatric and geriatric institution maintained an occupancy rate of 91% in 1988 and over 95% during 1989–1991.

Outpatient services include emergency care on a 24-hour basis and general practice and specialty clinics at PMH and Rand. In 1991 there were 181,053 outpatient visits to PMH, down from 208,180 visits in 1988 and 200,841 visits in 1989, but somewhat higher than

the low of 177,084 visits in 1990. The overall decrease is due to a reduction in the number of general practice clinic visits. At Rand, there were 47,468 outpatient visits in 1988, 44,482 in 1989, 43,452 in 1990, and 55,701 in 1991. The increase in visits between 1990 and 1991 at Rand can be explained by a 36.5% increase (from 34,289 to 46,805) in the number of emergency clinic visits.

There are two private hospitals, both of which are located in New Providence. One is the Doctor's Hospital Ltd., which completed expansion to 72 beds (from 24 beds) in 1993. The other is the Lyford Cay Hospital, with 12 beds.

Currently, the brunt of institutional care of the elderly is borne by the Ministry of Health and the Environment through its geriatric care hospital; however, there are several small "homes" or hostels that serve persons in this group.

Public health services are delivered through the community health clinics in New Providence and throughout the Family Islands, as well as through other community-based programs such as home and district nursing and disease surveillance. Table 3 provides a count of the Ministry's health care facilities on each island—a total of 55 community clinics and 60 satellite clinics.

A major restructuring of the administrative arrangements of the community health services was carried out in 1991 to bring this area more in line with the approaches followed at the hospitals, which will facilitate transitions to decentralization. An administrator was

appointed and was supplied with a full team of support staff and appropriate physical facilities.

In 1991, there were 217,049 visits to the community health clinics in New Providence. This 35% increase over the number of visits in 1988 resulted from an expansion of services and facilities at these clinics. As a consequence, the volume of utilization of the outpatient clinics at the Princess Margaret Hospital decreased significantly. The community health clinics in the Family Islands provided 187,319 outpatient visits in 1991, up slightly from the 187,310 in 1990 but down from the 4-year high of 191,623 visits in 1988.

The Ministry of Health and the Environment also conducts a school program through its community clinics throughout the islands. This program checks children at least three times during their school career: in grades 1, 6, and 10. Anthropometric measurements as well as screenings for visual and oral abnormalities are included in the examinations.

Dental services are provided on an inpatient and outpatient basis at the Princess Margaret Hospital, which had a complement of 12 dentists in 1992.

Currently, the responsibility for medical care and compensation for workers injured on the job remains with the National Insurance Board (NIB) of the Ministry of Social Services, National Insurance, and Housing. Through this institution, workers who suffer a job-related injury receive full coverage of all medical bills, both locally and abroad, if the correct referral procedures are followed.

TABLE 3
Distribution of government health services facilities, Bahamas, 1991.

| Island or island groups | Island population (1990) | Hospitals | Community clinics | Satellite clinics |
|---|-----------------------------|-----------|-------------------|-------------------|
| New Providence | 171,542 | 2 | 8 | - |
| Grand Bahama | 41,035 | 1 | 5 | 5 |
| Abaco | 10,061 | | 7 | 8 |
| Acklins, Crooked Island, and Long Cay | 851 | | 4 | 5 |
| Andros | 8,155 | | 6 | 8 |
| Berry Islands | 634 | | 1 | 1 |
| Bimini | 1,638 | | 1 | - |
| Cat Island | 1,678 | | 3 | 6 |
| Eleuthera, Harbour Island, and Spanish Wells | 10,524 | | 9 | 10 |
| Exuma and Ragged Island | 3,628 | | 5 | 5 |
| Inagua and Mayaguana | 1,293 | | 2 | 2 |
| Long Island, San Salvador, and Rum Cay | 3,646 | | 4 | 10 |
| Total | 254,685 | 3 | 55 | 60 |

TABLE 4
Percentage of households without piped water inside the house and using pit latrines or no method for sewage disposal, by location, Bahamas, 1988–1989.

| Location | (n) ^a | % without piped water | % with pit latrines | % with no method |
|----------------|------------------|-----------------------|---------------------|------------------|
| New Providence | (347) | 13.5 | 9.2 | 0.9 |
| Grand Bahama | (207) | 8.7 | 8.7 | 0.5 |
| Family Islands | (213) | 39.4 | 27.8 | 3.8 |
| All Bahamas | (767) | 19.4 | 14.2 | 1.6 |

^a(n) = Sample size (stratified cluster selection).

Environmental Services

The environmental concerns of the Ministry are managed by the Department of Environmental Health Services, whose prime responsibility is activities aimed at managing and conserving the Bahamian environment. These functions are conducted through three divisions: the Health Inspectorate Division, the Environmental Monitoring and Risk Assessment Division, and the Solid Waste Collection and Disposal Division.

The provision of potable water is the responsibility of the Water and Sewerage Corporation of the Bahamas. The primary water source for the country is groundwater (which accounts for about 95% of all the water consumed). Rainwater collected in tanks and cisterns supplies 3% of water needs; reverse osmosis operations are used very little.

The water supply in New Providence, with its large resident and tourist populations, is greatly inadequate. A system of transporting water by barge from Andros, a large neighboring island, has been in use for the last two decades.

The salinity of the groundwater is above acceptable levels, giving the water a salty taste. Many people purchase bottled treated water for drinking.

A substantial number of areas are without piped potable water, and even where piped water is available, handling methods are often unsatisfactory. Table 4 presents national and area-specific estimates of the proportion of households without piped water inside the house. Over 13% of the households in New Providence are without piped connections.

Also shown in Table 4 is the proportion of households using pit latrines (over 14% in the Bahamas as a whole and as many as 28% in the Family Islands) and the proportion of households with no method of sewage disposal (3.8% in the Family Islands and 1.6% in the total population).

The Health Education Division provides regular training for workers in food establishments. Concerns

over the outbreak of seafood poisonings mentioned above dictated the need for stepped-up monitoring and control programs by teams in the environmental health, agriculture, and health education departments.

Social and Community Participation

Many nongovernmental organizations, covering a wide spectrum of interests, are involved in the fight to improve the health of the Bahamian population. Some of the most visible of these organizations include the Bahamas Heart Association, the Bahamas Diabetic Association, and the Cancer Society of the Bahamas.

Available Resources

Over 4,500 persons are employed by the Ministry of Health and the Environment, of whom approximately 67% work in hospital services, 15% in community health services, 14% in environmental health, and 4% in the central administration.

A preliminary breakdown by occupational groups from the 1990 census gives a count of 2,881 health professionals and technicians. These personnel are spread between private and public services and include all life science professionals and technicians, health and quality inspectors, and other job categories.

For the country as a whole, the numbers of physicians in the public and private sectors rose sharply from 312 in 1989 to 370 in 1990, 371 in 1991, and 373 in 1992. During this 4-year period the number of physicians in the private sector increased by 20.7% and the number in the public sector by 18.9%. In 1989 there were 53 dentists in the public and private sectors, a number that rose to 57 in 1990 and stood at 59 in 1991 and 58 in 1992; the increase resulted from a greater number of dentists in the private sector. The number of public-sector registered nurses (staff nurses and nursing officers of all grades) rose from 623 in 1989 to 633 in 1990, reached a high of 636 in 1991, and then dropped to 629 in 1992. The number of trained clinical nurses (public) also rose between 1989 and 1990, from 457 to 467, but then decreased to 459 in 1991 and 438 in 1992.

The country depends on external sources for skilled professional and technical training in some of the health fields. There is a School of Nursing, the administration of which has recently passed from the Ministry of Health and the Environment to the College of the Bahamas, a junior college that offers a wide variety of programs including an associate-level degree in the biological sciences.

BARBADOS

GENERAL HEALTH SITUATION AND TRENDS

Barbados is the most easterly of the Caribbean islands. It extends for 431 km², through mostly flat terrain that rises just over 334 m at its highest point.

The country is a democracy, and it holds parliamentary elections every 5 years. The Government consists of a Governor-General, who represents the Government of the United Kingdom and is the Head of State; a 21-member nominated Senate; and an elected House of Assembly of at least 27 members. The Constitution provides for a Privy Council (the members of which are appointed by the Governor-General after consultation with the Prime Minister) and a Cabinet. The Cabinet, comprised of Ministers, is the main policy-making organ; it is presided over by the Prime Minister, who is appointed by the Governor-General and is the Head of Government.

Health and Living Conditions

Barbados' gross domestic product has shown a persistent decline in recent years—4% in 1991 and 3.1% in 1990; real output in agriculture, tourism, and manufacturing declined by 4.6%, 5.8%, and 3.9%, respectively, from 1990 to 1991. The per capita income was BDS\$ 11,200 in 1991. At the end of December 1991, the adult population was 187,600 persons, 122,500 of whom comprised the labor force. Approximately 64,700 persons, or 52.8% of the labor force, were male. The rate of unemployment for 1991 was estimated at 17.1%, and it was recorded as high as 20% in the last quarter of that year. Approximately 60.3% of the unemployed were between 15 and 19 years old. Wage increases secured in 1991 generally fell below increases awarded in 1990, and inflation averaged 6.3%, as compared to 3.1% in 1990.

During fiscal year 1991–1992, the Government introduced a stabilization program that aimed at curbing aggregate demand in order to protect and strengthen foreign reserves. The program's measures included further controls on credit and interest rate increases. The Government negotiated an International Mone-

tary Fund stand-by arrangement of US\$ 428.4 million and an additional US\$ 429.7 million from the Fund's Compensatory and Contingency Financing Facility to support the balance of payments.

Tourism remained as the major source of revenue in 1991, although real output in the tourism sector declined by 5.8% as compared to 1990, given that tourist expenditure fell by 6.8%, to US\$ 919.5 million.

Because of its size, flat terrain, and excellent communication infrastructure, Barbados is mainly an urban island. A good network of roads and a good system of private and public transportation allow the population considerable mobility. More than 75% of households have telephones installed, and telecommunication services are available and accessible. Electricity and potable water are available to more than 90% of all households.

The housing situation in Barbados is fairly stable, with most lower-middle, middle, and upper classes owning their own homes. In 1990, the country had 75,170 households, with an average family size of 3.3 persons; 70,693 households had piped water.

The literacy rate in Barbados is estimated to be 96%. Education is free at primary and secondary schools, but tertiary-level students have to pay a small percentage of the cost of study. There is full enrollment for primary education and little attrition during secondary school years.

Population

Barbados is heavily populated, with 599 persons per km². According to the 1990 census, the population in May was 260,491, of which 124,571 (47.8%) were men and 135,920 (52.2%) were women. Life expectancy was 75.2 years for females and 70.2 for males. Since 1980, the average annual population growth rate has been 0.2%, although the rate was 0.6% in 1989. The resident population decreased to 258,600 in 1991.

The crude birth rate increased from 15.2 to 16.8 per 1,000 inhabitants, and the general fertility rate rose from 60.6 to 67.3 per 1,000 women 15–44 years old from 1988 to 1990. In 1990, there were 65,071 females aged 15–44 years, and the number of live births was

4,377. Birth registration is complete—more than 98% of all babies are delivered in hospital, and births must be recorded immediately.

The migrant population in Barbados increases only during the crop season, when cane cutters come from neighboring Caribbean countries for the sugar cane harvest.

The ethnic makeup of Barbados breaks down as follows: approximately 94% is of African descent; 5%, Caucasian descent; and 1%, other, a combination of East Indian and Chinese.

Mortality

The crude death rate has remained fairly constant over the past few years; it was 8.7 per 1,000 inhabitants in 1990. During 1988–1990 the total number of registered deaths was 6,739: of these, 213 (3.2%) were under 1 year of age, 24 were 1–4 years old, 41 were 5–14 years old, 137 were 15–24 years old, 414 were 25–44 years old, 931 were 45–64 years old, and 4,974 were 65 years old and older; 5 were of unknown age. The five leading groups of causes of death accounted for 64.8% of the total number of deaths. These five groups were cardiovascular diseases (ICD-9, 393–398; 410–429), representing 19.9%; malignant neoplasms (140–208), representing 19.0%; cerebrovascular disease (430–438), representing 12.3%; diabetes mellitus (250), representing 8.5%; and “other” circulatory system diseases (440–459) with 5.1%.

In 1990, the leading groups of causes of death for children under 5 years old were certain conditions originating in the perinatal period (760–779), 44 deaths; congenital anomalies (740–759), 11 deaths; septicemia, 3 deaths; pneumonia, 3 deaths; and AIDS, 2 deaths. These five groups accounted for 85% of deaths in this age group.

The main causes of death in the age group 15–44 years old for 1990 were homicide, traffic accidents, drownings, and suicide, with totals of 39, 30, 24, and 8, respectively, representing among them 66% of all the deaths in this age group.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

The infant mortality rate was 15.3 per 1,000 live births in 1990, and the neonatal death rate was 12.1 in

1989. A breakdown of neonatal deaths shows that 49% of them occurred in infants under 1 day old. The low infant mortality rate is due largely to an extremely low post-neonatal mortality rate. Neonatal deaths account for 79.1% of all deaths for infants under 1 year old.

For 1988–1990, the mortality rate for children 1 to 4 years old was 0.5 per 1,000 in that age group; for the age group 5 to 14 years old, the mortality rate in the same period is 0.4 per 1,000.

From 1988 to 1990, the four leading discharge diagnoses of children under 5 years old at the Queen Elizabeth Hospital were certain conditions originating in the perinatal period; diseases of the upper respiratory tract; congenital anomalies; and bronchitis, emphysema, and asthma.

Health of Adolescents and Adults

For the age group 15 to 44 years old in 1990, there were 1,788 hospitalizations for accidents and violence, which represent 61.5% of all hospitalizations for these causes and an average of 14 hospitalizations per 1,000 people in this age group.

Chronic noncommunicable diseases are the main causes of death and chronic illness in the adult population. They also are responsible for much disability and loss of productivity, and they are the source of many socioeconomic problems in the country. In 1990, there were 91 diabetics who had lower limb amputations. At the Queen Elizabeth Hospital there were 943 hospitalizations for diabetes in 1990.

A survey conducted by the National Nutrition Center in 1981, identified obesity as a major problem among adult and adolescent females. In the past few years there also has been an increase in obesity among males.

Health of the Elderly

Chronic noncommunicable diseases such as arthritis, hypertension, and diabetes mellitus are the main health disorders among the elderly, and the major causes of death in this age group are heart disease and cerebrovascular disease. The age group 65 years old and older is most often afflicted by chronic adult disabilities such as blindness and poor vision, but diabetic retinopathy is not a major problem. The prevalence of chronic glaucoma and cataract among adults 65 years old and older is high, as evidenced by 74 cases of glaucoma and 259 cases of cataract in that age group in 1990.

Health of Women

Abortions represent 2.9% of total discharge diagnoses (765 in 1990); this suggests that abortion may be being used as a birth control method. There were 12 maternal deaths in the 3 year period from 1988 to 1990, which corresponds to a maternal death rate of 9.7 per 10,000 live births.

Cancer of the cervix and breast remain the major causes of death among women. In 1990, there were 21 deaths from cervical cancer and 34 deaths from breast cancer. Admissions to the hospital for those diseases were 82 for breast cancer and 58 for cervical cancer.

Workers' Health

Since the early 1980s, the health of workers has been safeguarded by the provisions of the Factories Act, which governs safety and health in the workplace. That Act is administered by the Ministry of Labor and is overseen by the Labor Department in collaboration with the Environmental Engineering Division, a department responsible for occupational safety and health within the Ministry of Health. The officers of those agencies mainly focus on ensuring that the workers in the various factories are not subjected to any undue danger or potentially hazardous health conditions, and encourage workers to utilize the mandatory protective gear prescribed for various jobs.

Health of Special Groups

Most severely disabled persons in the country receive custodial type care in government institutions. The government-owned Children's Development Center offers a structured assessment program for children with all types of disabilities, and both public and private educational institutions cater to their academic needs. Some disabled adults are gainfully employed.

Diseases and Health Impairments

No cases of *yellow fever* have been recorded in Barbados for more than 100 years, and there have been no indigenous cases of *malaria* recorded since 1935, although there were three imported cases of malaria in 1990.

A concerted education campaign must be launched in order to elicit the public's participation in reducing the prevalence of the *Aedes aegypti* mosquito, since in

1990 positive findings increased to 4,485, with an *Aedes* index of 2.13, compared to 2,644 positive findings and an *Aedes* index of 1.80 in 1989. This led to a *dengue* outbreak that began in 1990, with 236 cases registered in that year. No cases of *dengue hemorrhagic fever* have been detected.

No cases of *poliomyelitis* have been recorded in the last decade. In 1990 there were six cases of *tetanus*, with five deaths, and three cases of *whooping cough*. That same year, there was an outbreak of *rubella*, with 165 cases, whereas only one case had been registered in 1988, and none in 1989. In 1990, there were 128 cases of *measles*, but following the successful measles campaign late in 1990, only 2 cases were recorded for 1991 and none for 1992, despite an intensive search.

No cases of *cholera* have been registered in Barbados after the most recent pandemic reached the Americas in 1991. In 1990, 30 cases of *gastroenteritis* were registered in the age group under 5 years old, as were 88 cases of *bacillary dysentery*. There also was one case of amoebic dysentery registered in 1990.

In 1990, there were seven cases of *tuberculosis* reported (two were imported), and there was one imported case of *leprosy*. In 1992, there were three cases of leprosy; the consistently low number of cases reported would indicate that the elimination of this disease is imminent.

In 1990, in the age group under 5 years old, there were ten cases of *bronchopneumonia*, one death from acute bronchitis and bronchiolitis, and three deaths from pneumonia. In the age group 65 years old and older, 58 deaths from pneumonia occurred; likewise, 13 of the 22 deaths from bronchitis, chronic unspecified emphysema, and asthma occurred in this age group.

From 1988 to 1990, the number of cases of *leptospirosis* has been 31, 25, and 43, respectively, with 4 deaths occurring in 1990. No cases of rabies or other zoonoses were reported in 1990.

Since the first *AIDS* case was diagnosed in 1984, cases have steadily increased. The number of new *AIDS* cases in 1990 was 61, compared to 26 and 40 in 1988 and 1989, respectively. In 1990, the disease was reported in 51 men and 10 women, of whom 31 (61%) and 3 (30%), respectively, had died.

Transmission through sexual contact accounts for more than 99% of all *AIDS* cases. In the early years of the *AIDS* epidemic, homosexual males accounted for practically all of the cases, but the National Advisory Committee on *AIDS* has recently reported that bisexual and heterosexual transmission of the disease is rapidly increasing. At present, homosexual and bisexual transmission accounts for 45% of all cases, while

TABLE 1
AIDS cases and deaths, Barbados, 1984 to 1992.

| Year | Cases | Deaths |
|------|-------|--------|
| 1984 | 2 | 1 |
| 1985 | 9 | 5 |
| 1986 | 21 | 13 |
| 1987 | 24 | 16 |
| 1988 | 15 | 16 |
| 1989 | 40 | 31 |
| 1990 | 61 | 34 |
| 1991 | 80 | 59 |
| 1992 | 78 | 77 |

heterosexual transmission accounts for 42%. The current male-to-female ratio of heterosexual transmission is 3.5:1.

During the first quarter of 1993, pediatric AIDS cases accounted for 7 out of a total of 20 cases. Table 1 shows the breakdown of AIDS cases and deaths since the epidemic's inception until 1992.

There has been a steady decline in reported cases of *syphilis* (411 in 1987, 389 in 1988, 276 in 1989) and *gonorrhoea* (706 in 1987, 350 in 1988, 283 in 1989). In 1990 there were 182 new cases of syphilis and 113 new cases of gonorrhoea reported.

At the Queen Elizabeth Hospital there were 17 hospitalizations for and 7 deaths from *nutritional deficiencies* in the age group 65 years old and older, and 943 hospitalizations for *diabetes mellitus* with 194 deaths. *Cardiovascular diseases* accounted for 997 hospitalizations and 54 deaths from hypertensive disease, 236 deaths from ischemic heart disease, 166 deaths from acute myocardial infarction, 225 deaths from other forms of heart disease and diseases of pulmonary circulation, and 272 deaths from cerebrovascular disease.

In 1990, *malignant neoplasms* accounted for 962 hospitalizations, consisting of 66 malignant neoplasms of stomach, with 46 deaths; 36 of colon, with 24 deaths; 39 of rectum, rectosigmoid junction, and anus, with 21 deaths; 13 of pancreas; 37 of trachea, bronchus, and lung, with 26 deaths; 82 of female breast, with 34 deaths; 58 of cervix uteri, with 21 deaths; 22 of uterus, part unspecified; 122 of prostate, with 67 deaths; and 43 leukemia cases, with 12 deaths. Benign neoplasms of the uterus accounted for 571 hospitalizations. The cervix and breast are the main sites for malignant neoplasms among women 15 years old and older. The most frequent cancer location in men was the prostate, and this accounted for 64 deaths in men 45 years old and older.

In terms of *accidents and violence*, in 1990 there were 642 hospitalizations for fractures, 320 for intracranial and internal injuries, 67 for burns, and 327 for poisoning and toxic effects. There also were 1,284 hospitalizations for accidents and adverse effects, including 269 for motor vehicle accidents, with 22 deaths (2 of which occurred in the age group 1–4 years old, 11 in the age group 15–44 years old, 7 in the age group 45–64 years old, and 2 in the age group 65 years old and older); 310 for accidental falls, with 18 deaths (12 in the 65 years old and older age group); 162 for suicide and self-inflicted injury, with 16 deaths, all in persons older than 15 years old; and 222 for homicide and injury purposely inflicted by other persons, with 34 deaths, 23 of which occurred within the age group 15–34 years old and 8 in the age group 65 years old and over.

An outreach community mental health approach that was introduced in the polyclinics in 1988 was largely responsible for the identification of various stages of *mental health disorders*. The single psychiatric hospital provides inpatient psychiatric care, and outpatient services are provided in the polyclinics. The alcohol and chemical dependency treatment center at St. Joseph Hospital, which has been operational since October 1992, is the only government-owned institution that provides substance-abuse treatment on a fee for service basis. One of the major causes of admission to hospital for the age group 15–44 years old was attempted suicide, with 153 hospitalizations. In 1990, there were 257 hospitalizations for other mental disorders, 158 and 61 of which occurred among persons 15–44 years old and 45–64 years old, respectively; 19 of the 20 deaths from mental disorders occurred in the age group 65 years old and over.

Risk Factors

Barbados has carried out a vigorous ocean pollution monitoring program, which has resulted in a reduction of the risks of marine contamination and in the excellent quality of the country's potable water. The 1969 Health Services Nuisances Regulation governs air pollution.

The country has no forests or jungles, although there are a few woodlands. Farmlands consist of relatively small tracts (40 acres), and are mainly used to grow vegetable crops, fruit trees, and sugar cane, or for animal husbandry and poultry rearing ventures. The waste from these animals could endanger human health; for example, the high ammonia content in pig urine could contaminate the water supply.

Although Barbados has no volcanoes, no flood problems, and no earthquake activity, it lies within the hurricane belt. Consequently, there is a concerted vigilance each year during hurricane season, from July to September. The Central Emergency Relief Organization is responsible for disaster preparedness.

In 1990, there were 96 cases of salmonellosis reported, with 1 imported case and another case of food-borne illness. The Public Health Inspectorate in 1990 condemned 1.7% and 0.1% of local and imported meat inspected, respectively. In addition, 1.0% of local and 0.8% of imported poultry was condemned, as was 0.3% of imported fish.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

As a result of the economy's structural adjustment, the population's reliance on public health services increased, further burdening the Government's budget. In 1990, there were 260,811 total visits at the various polyclinics, compared to 248,441 in 1989. Visits at the general practice units of the polyclinics totaled 149,280 in 1990, compared to 144,696 in 1989. Some of those services also have been cut back due to the same structural adjustments.

The Government of Barbados views health as a fundamental right and aims to provide comprehensive health care services to all Barbadians at a price that the country can afford. To achieve this goal, a community-oriented approach to primary health care is being emphasized, which makes effective use of governmental and nongovernmental organizations (NGOs) in all aspects of care. The strategy being adopted embraces the decentralization of primary care services and management with broad community participation in the promotion of health and disease prevention. Intra- and intersectoral coordination are being promoted as vehicles through which some of these strategies can be accomplished. Considering the country's economic situation, the Government is emphasizing improved management and other cost containment measures.

The Ministry of Health considers that health promotion is a crucial component of the primary health care strategy, and is actively engaged in collaborative efforts with NGOs such as the Barbados Cancer Society, the Heart Foundation, the Barbados Kidney Association, the Diabetic Association, and the Asthma Association to promote healthy lifestyles, abstinence

from drugs and alcohol, proper nutrition, and regular exercise.

The Barbados Family Planning Association and the National Advisory Committee on AIDS are promoting activities dealing with contraception and HIV/AIDS, respectively. Health education activities also are promoted at the polyclinics and hospitals through leaflets, slides, and videos, as well as through talks by health professionals.

The Ministry's priority programs are care of the elderly, mental health services, services for the disabled, development of convalescent and rehabilitative care, family life development, food and nutrition, and environmental services. The Ministry of Health is committed to improving the condition of vulnerable, high-risk population groups such as the elderly, the disabled, children, adolescents, and the mentally ill through priority programs targeted at these groups. Human resources development is being promoted as an essential component of the management of the health services. Staff training considers the best utilization of acquired skills, and efficiency also is achieved through the grouping of related areas of responsibility so that programs can be cohesively planned and administered.

Currently, the Government spends approximately 15% of the total annual budget on health, and those funds are used to upgrade and finance the operations of health facilities throughout the country.

The Ministry of Health, in collaboration with the Ministry of Agriculture, has been preparing a food and nutrition policy, which stresses the importance of self-sufficiency in food production, the importance of eating healthy meals and nutritious foods, and the benefits of regular exercise.

The Government is committed to ensuring that all citizens have access to clean drinking water, proper sanitation, and an environment that is safe and free from health hazards.

The Barbados Drug Service, which is a WHO Collaborating Center, has enabled the Ministry of Health to ensure that Barbadians receive quality drugs and pharmaceuticals.

Health research is actively encouraged, and the Ministry of Health is the base for a leptospirosis project.

In an effort to reduce teenage pregnancies, which are on the rise, the Ministry of Health is pursuing a vigorous family planning and family life education program in collaboration with the Barbados Family Planning Association and the Ministry of Education.

The Ministry of Health has introduced a three-tiered approach to the management of chronic noncommunicable diseases. Level I uses the risk reduction approach

of primary prevention, and is targeted at eliminating as many potential risk factors as possible; Level II includes examinations, screening, laboratory testing, other medical procedures, and follow-up at appropriate health facilities; and Level III centers around rehabilitative services.

The country has broad health legislation. The Health Services Act and its regulations, which were enacted in the late 1960s and early 1970s, are quite comprehensive, covering all areas that fall under the jurisdiction of the Ministry of Health, including communicable and notifiable diseases, disposal of offensive matter, transportation of human remains, rodent control, food hygiene, private hospitals and nursing homes, control of drugs, control of mosquitoes, notification of births, collection and disposal of refuse, and pathological laboratories. Other health-related legislation includes the sanitation service authority, dental registration, nurses and midwives registration rules, medical registration, paramedical professions, pharmacy, and the Mental Health Act.

Organization of Services

Personal Health Care Services

The infrastructure of personal health care services in Barbados comprises a combination of public and private facilities and nongovernmental organizations.

The government facilities are the acute care Queen Elizabeth Hospital, with its recently constructed neonatal intensive care unit and accident and emergency departments, which provides secondary, tertiary, and emergency care; the Psychiatric Hospital; the recently refurbished Geriatric Hospital and four district hospitals for geriatrics and the disabled; eight polyclinics and five outpatient clinics; the Hillside Home, housing three leprosy patients; the St. Andrew Children's Center for disabled adolescents; the Evalina Smith Ward for disabled adolescents; Committee Halfway House; and the Children's Development Center. The latter is responsible for the early diagnosis, assessment, and treatment of children identified as having physical or mental deficiencies.

The recently opened, government-owned St. Joseph Hospital, which currently operates 15 beds of its 108 bed capacity, is being run by a statutory board similar to that of a private hospital. It offers services in obstetrics and gynecology, general surgery, and medicine, as well as private consultations, and it includes the Alcohol and Chemical Dependency Treatment Center,

which provides inpatient and outpatient treatment services for a fee.

There are two small private hospitals with a total of 40 beds and several private nursing homes and senior citizen homes.

The government facilities offer the following services free of charge: acute care; emergency care; medical, nursing, and ancillary services; consultant services; psychiatric care; psychological counseling services; geriatric services; custodial care for the elderly and the disabled; drug rehabilitation therapy; counseling services; maternal and child health services; immunizations; dental services; Pap smears; and family planning and family life services.

Private facilities offer acute care, medical and nursing care, general practitioner services, immunizations, consultant services, psychological services, dental care, and convalescent and geriatric services. These services are utilized primarily by the middle and upper classes who can afford them.

Some NGOs such as the Barbados Family Planning Association, the Cancer Society, the Heart Foundation, the Kidney Association, the Association for Disabled Persons, and the Diabetic Association are actively involved in providing services, including counseling, the conduct of tests, and the provision of support to patients and families.

There is a good referral system among the polyclinics, district hospitals, and the Queen Elizabeth Hospital.

In 1990, there were 18,767 admissions, or 76.9 per 1,000 population, in the acute care Queen Elizabeth Hospital. Percentage occupancy was 73.7, with a bed turnover rate of 34.8. For the geriatric and district hospitals, admissions ranged from 281 to 17, with percentage occupancy ranging from 80.1 to 97.4 and the bed turnover rate at approximately 0.5. Information is not available on the private hospitals, and the St. Joseph Hospital has been only partially operational since March 1993. There were 260,811, 248,441, and 252,465 visits in all for 1990, 1989, and 1988, respectively, including visits to venereal disease clinics, maternal and child health clinics, dental and eye clinics, and visits for immunization.

These statistics indicate that although 47% of pregnant women receive prenatal care from private physicians, about one-half of them use the infant care services at the polyclinics.

In 1990, outpatient visits at the Queen Elizabeth Hospital specialist clinics were 84,456, with 55,179 for the accident and emergency and general outpatient clinics. Polyclinic visits, including visits to sexually

transmitted disease clinics, maternal and child health clinics, dental and eye clinics, and immunization visits, and excluding general practice, were 260,811; general practice visits were 149,280 and family practice unit visits, 11,117. Visits at the occupational therapy department of the psychiatric hospital were 10,873 for 1990, including the visits of 107 new patients. Information is not available for visits to private doctors.

The Queen Elizabeth Hospital has CAT scan and ultrasound facilities. Radiotherapy treatment also is available there and at private medical clinics. Statistics for 1990 from the radiotherapy department of the Queen Elizabeth Hospital indicate that the following treatments were given: cobalt 60, 5,367 (to 307 patients); superficial X-ray therapy, 204; deep X-ray therapy, 25; beta plaque applications, 23; intracavitary insertions, 114; isotope therapeutic doses, 39; thyroid scans, 195; liver scans, 24; lung scans, 67; and other scans, 218. Outpatient visits were 3,433 and 769 new patients were referred.

Prenatal care is available in the polyclinics as well as from private obstetricians. Maternal and child health statistics from the polyclinics and outpatient clinics show that in 1990 there were 2,338 new attendants in a total of 25,526 prenatal visits, with an average of 11 visits per case and 53% of the 4,377 live births. In that same year there were 2,247 postnatal visits, and 3,208 new registrations for infant care relating to 73% of live births. Statistics are not available for the babies born to women who received prenatal care from private doctors, but it is estimated that approximately 47% of babies born were to women in that category, and that about one-half of them make use of the infant care services at the polyclinics.

Bed utilization statistics from the Queen Elizabeth Hospital show that there were 5,311 obstetric admissions, with an 88% occupancy rate and a 90.9 bed turnover rate. There were 621 cesarean deliveries. In the polyclinics there were 47,110 visits for babies and infants.

Immunizations are available in the polyclinics and from private pediatricians. The Ministry of Health adheres to the universally accepted immunization schedule, and at the end of 1990 had achieved 85.2% and 84.5% coverage for DPT and polio, respectively, for the age group under 1 year old; for 1-year-olds, the figures were 79.3% and 82.3%, respectively; for 2-year-olds, 85.7% and 81.9%, respectively; for 3-year-olds, 88.1% and 75.0%, respectively; and for 4-year-olds, 90.9% and 90.7%, respectively. The coverage for measles was 87.4% for 1-year-olds, 84.4% for 2-year-olds, 97.5% for 3-year-olds, and 93.0% for 4-year-olds.

Family planning services are available in the polyclinics, from private doctors, and from the Barbados Family Planning Association. In 1990, there were 579 new family planning participants in the polyclinics out of a total of 6,889 participants. The figures from the Barbados Family Planning Association show 1,499 new participants for that period, out of a total of 5,103 participants.

The Red Cross Society, the Meal on Wheels Program, and the Salvation Army provide daily free meals to some elderly citizens. All primary school children are entitled to receive school meals daily at minimal cost.

Dental services are available in the polyclinics for schoolchildren, the disabled, the elderly, and pregnant women only. Private dental practitioners provide dental care for most adults. Dental statistics from the polyclinics for 1990 reveal that there were 24,915 visits, 9,323 extractions, 7,493 fillings, 8,339 prophylaxes, and 198 root canals. Information is not available on the statistics from the private dental practitioners.

All psychiatric services are provided by the single government-owned Psychiatric Hospital. In 1990, there were 1,379 admissions, or 5.4 per 1,000 population, with a percentage occupancy of 97.6 and a bed turnover rate of 2.2. A drug rehabilitation unit has recently opened at the St. Joseph Hospital; it attracts wealthy clients who pay for services and would formerly have gone overseas for treatment.

Most services for the disabled are provided by the Ministry of Health, and take the form of custodial care for the severely disabled. The St. Andrew Children's Center and the Evalina Smith Ward cater to adolescents with disabilities. At the Children's Development Center, children are assessed for various disabilities and appropriate treatment programs are developed. That center also runs a day care facility for disabled children. The Ministry of Education operates a school for the hearing impaired in addition to a school for the mentally retarded and learning impaired. There also are two private learning institutions, the Challenor School and the Learning Center, which cater to the educational needs of visually impaired children. The Blind Workshop is the only facility that actively teaches skills with which the disabled can earn a living. The National Association of Disabled is instrumental in bringing the disabled together and teaching members how to help each other and be self-sufficient.

The Ministry of Health, in collaboration with the Cancer Society, has been encouraging all sexually active women to have regular Pap tests; the polyclinics provide them as part of their postnatal care.

Since the outbreak of cholera in the Region, the country's health authorities have mounted an intensive surveillance campaign to ensure that food protection practices are maintained.

Environmental Services

Practically all of the institutions that provide environmental services are government-owned. They include the Public Health Inspectorate, the Rodent and Vector Control Unit, the Environmental Engineering Division, the Coastal Conservation Unit, the Town and Country Planning Division, and the South and West Coasts Sewerage Project, as well as the Statutory Corporations of the Sanitation Service Authority and the Barbados Water and Sewage Authority.

The Ministry of Health's Environmental Engineering Division is responsible for monitoring and controlling land, sea, air, and noise pollution; drinking water; oil pollution; and hazardous materials. It also monitors and licenses public swimming pools; monitors and controls sewage treatment plants; and approves health and environmental aspects of construction. In addition, it checks leachate in landfills, removes derelict vehicles, and houses and monitors the groundwater supply.

The Barbados Water Authority is responsible for drinking water quality. Potable water is available to all Barbadians, and 70,693 out of a total of 75,170 households have piped water.

The Bridgetown Sewerage project treats waste generated in the Greater Bridgetown area, and the South and West Coasts Sewerage Project handles the sewage for those areas. The Inter-American Development Bank has made approximately US\$ 79 million available for sewage treatment in the south coast.

The Sanitation Service Authority is responsible for the collection and disposal of the country's solid waste and garbage, and operates one landfill and a pulverization plant. It also is responsible for the control and maintenance of cemeteries. The Government is currently negotiating with the Inter-American Development Bank for funding of a solid waste project.

The Public Health Inspectorate, which is linked to the various polyclinics, is responsible for ensuring that households and businesses are maintained in sanitary conditions. The inspectors advise the public on the storage of food and water, safe food preparation procedures, and the disposal of food and garbage. They issue licenses to businesses that sell food, restaurants,

slaughterhouses, and other related enterprises, and are empowered to prosecute persons for violating health services regulations. The Rodent and Vector Control Unit is based in the Ministry of Health, and is responsible for controlling rodents, mosquitoes, and other vectors. Its officers advise households and businesses on proper baiting procedures, as well as on the uses of pesticides, larvicides, and fogging.

Health Research and Technology

The Ministry of Health's leptospirosis project is responsible for conducting research on that disease. There also is ongoing research on diabetes and there is a model diabetic clinic at the Randall Phillips Polyclinic. The Ministry is represented at the Commonwealth Medical Research Council meetings and presents papers on various topics of specific interest.

Available Resources

Human Resources

At the end of 1990, medical doctors numbered 294, which represents a ratio of 1 for 874 inhabitants. There also were 33 dentists (1:7,790), 836 nurses (1:307), 502 nursing assistants (1:507), 12 veterinarians (1:21,424), and 486 other technical health sector personnel, excluding clerical, administrative, and maintenance staff. Several training programs are in existence, ranging from inhouse seminars and workshops, to courses held at local educational institutions or at overseas institutions. Continuing education is promoted as an integral part of personnel development, as well as a means of keeping up to date on the latest developments in a given field. Public health training is mainly provided for doctors, nurses, administrators, inspectors, and engineers who work in or closely with the polyclinics.

Financial Resources

For fiscal year 1990-1991, the recurrent government expenditure on health was BDS\$ 158,501,545, or 15.1% of the total recurrent government expenditure, which corresponds to approximately BDS\$ 612.82 per capita. In 1990, personnel expenditures accounted for approximately 70% of the total health expenditure.

TABLE 2
Type and capacity of health establishments,
Barbados, 1992.

| Institution | Type | Beds |
|---------------------------|--------------------|-----------------|
| Queen Elizabeth Hospital | Acute care | 539 |
| St. Joseph Hospital | Acute care | 15 ^a |
| Psychiatric Hospital | Psychiatric | 627 |
| Geriatric Hospital | Geriatric | 428 |
| Four district hospitals | Geriatric/disabled | 439 |
| St. Andrew Center | Disabled youths | 20 |
| Woodside Clinic (private) | Acute care | 10 |
| Bayview Hospital | Acute care | 30 |
| Total | | 2,108 |

^a Under construction. Final capacity will be 108 beds, bringing the total capacity for all institutions to 2,201.

Physical Resources, Equipment, and Supplies

Table 2 presents the types and capacity of the country's institutions. The Ministry of Health is moving towards total computerization, and the Queen Elizabeth Hospital and the polyclinics already are equipped with computers. There exists an adequate fleet of vehicles, including an emergency ambulance service. There is one laboratory at the Queen Elizabeth Hospital and one at the Sir Winston Scott Polyclinic; these are complemented by three private laboratories. The country's single blood bank is in Queen Elizabeth Hospital, where most diagnostic and treatment procedures also are performed, except for a few conducted in the offices of private medical practitioners.

The Drug Formulary Committee must approve all pharmaceuticals used in the government health ser-

vices and that are listed in the Barbados National Drug Formulary. The formulary is prepared, maintained, and updated by the Barbados Drug Service, which is mainly responsible for providing a continuous supply of formulary drugs and related items to health care institutions in the public and private sectors; for rationalizing the use of formulary drugs and reducing their cost to the public; for making arrangements for the selection, procurement, distribution, and utilization of formulary drugs; for providing certain categories of persons with drugs and related items either free of cost or subsidized at point of delivery; and for improving and strengthening the inventory and general management system of the government pharmacies. There are 15 government pharmacies located at district hospitals and polyclinics. The Drug Service's relationship and cooperation with private pharmacies in the country is excellent, ensuring that the public is well served. Private pharmacies assist the Service by providing drugs to public patients, for which they are reimbursed.

The Drug Service operates a special benefit service in which the following categories of persons are eligible to receive drugs free of cost at point of service: persons 65 years old and older, children under 16 years old, and persons who receive prescribed formulary drugs for the treatment of hypertension, diabetes, cancer, epilepsy, and asthma. For fiscal year 1989, BDS\$ 4,701,087.00 were paid to private participating pharmacies for filling 371,327 prescriptions; in 1988-1989, BDS\$ 3,693,598.00 were spent for 362,718 prescriptions. The total Drug Service budget for 1990-1991 was BDS\$ 15.1 million or 10% of the health budget. Of that total, BDS\$ 13.1 million was allocated for the purchase of drugs and related items.

BELIZE

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

According to the World Bank, Belize's gross domestic product (GDP) per capita in 1991 was estimated at US\$ 2,010, as compared to US\$ 1,120 in 1985. The minimum wage for workers in the agricultural sector, agroindustry, and export industries is US\$ 1 per hour, and it is US\$ 1.13 per hour for some manual laborers. The annual average income of a worker with no formal education is estimated at US\$ 2,399 and that of a worker with a primary-level education is US\$ 3,135, whereas an individual with a secondary education earns US\$ 4,443.50 and a person with a university education averages US\$ 9,382.50. Over three-quarters (76%) of the total population completes at least primary school; in urban areas the proportion is 81% and in rural areas, 70%. The proportion of the population with a secondary education is 14% overall, 22% in urban areas, and 6% in rural areas. The 1991 census revealed differences between districts in terms of educational levels. For example, 22% of the population of all the districts combined reached the secondary level, but in the district of Toledo the figure was only 6.2%.

The country's economy grew by an average of 8% per year during the period 1985–1990. The average annual growth in the GDP was over 10.9% in the period 1987–1990, compared to a growth rate of approximately 2.5% in 1985–1986. The fastest-growing industries (construction and tourism, for example) were in the secondary and service sectors, although the export crop industry has also expanded in recent years. The principal reason for the rapid expansion in production since the mid-1980s has been the significant increase in both public and private investment, with capital investment up over 140% compared to the early 1980s, to US\$ 100.5 million (31.4% of the GDP), for the period 1986–1989.

The fiscal position of the central government and nonfinancial public institutions has improved tremendously. The current balance of payments of the central

government shifted from a deficit of US\$ 8.2 million in fiscal year 1985–1986 to a surplus of US\$ 18 million in fiscal year 1989–1990, owing to a substantial rise in revenues coupled with a minimal increase in spending.

Population

The census conducted in 1991 put the population of Belize at 189,392, for a population density of 8.2 inhabitants per km² in the country's 22,963-km² land area. A survey carried out after the census revealed 1.84% undercounting. Table 1 shows the age and sex distribution of the enumerated population.

The country is divided into six districts, which contain the following proportions of the total population: Belize, 30%; Cayo, 20%; Orange Walk, 16%; Corozal, 15%; Stann Creek, 10%; and Toledo, 9%. Belize City has 28% of the total.

The percentage of rural population has increased in recent years owing to an influx of immigrants from El Salvador, Guatemala, and Honduras—many of whom work in agriculture in various rural areas—and to emigration from urban areas to other countries. Those who immigrate to Belize are mainly rural inhabitants with low levels of education, whereas those who emigrate have generally completed secondary school or have professional training.

The population defined as "Creole" (of mixed African and European heritage) makes up 30% of the total population, and "mestizos" (persons of mixed heritage descended from Spanish colonists and indigenous peoples) constitute 43.6%. In the past the Creole population was the majority. Other ethnic groups living in the country include the Garífunas (6.6%), the Ketchi Mayas (4.3%), the Mopán Mayas (3.7%), and several smaller groups.

Between 1970 and 1980 the population grew by 25,708 inhabitants. Between 1980 and 1990 the increase was 44,039.

The estimated crude birth rate for 1990 was 35 per 1,000 population, and the crude death rate was 4 per 1,000. The total fertility rate is 4.5. A woman living in a rural area has, on average, two children more than a

TABLE 1
Age and sex distribution of the population of Belize
according to the 1991 census.^a

| Age group | Total | Males | Females | % |
|-------------|---------|--------|---------|-------|
| Total | 189,392 | 96,325 | 93,067 | 100.0 |
| 0-4 | 30,415 | 15,487 | 14,928 | 16.1 |
| 5-14 | 52,686 | 26,046 | 25,640 | 27.8 |
| 15-24 | 37,815 | 18,745 | 19,060 | 20.0 |
| 25-34 | 26,941 | 13,930 | 13,011 | 14.2 |
| 35-44 | 16,051 | 8,150 | 6,901 | 8.4 |
| 45-54 | 9,471 | 4,817 | 4,654 | 5.0 |
| 55-64 | 7,556 | 3,853 | 3,793 | 4.0 |
| 65 and over | 8,457 | 4,297 | 4,160 | 4.5 |

^aPopulation not adjusted with the underenumeration factor of 1.84%.

Source: Central Office of Statistics

woman in an urban area, and mothers with the least education have the highest number of children. The fertility rate among women in the upper socioeconomic strata is 2.7; among employed women it is 2.9.

Mortality

In the past 20 years the crude death rate has shown a tendency to decline, falling from 6.8 per 1,000 population in 1970 to 5.6 in 1980 and 4.2 in 1989. Mortality rates among men are slightly higher. In recent decades mortality has decreased in all the districts except Belize, which is the referral point for seriously ill patients.

Between 1980 and 1990 mortality rates remained essentially unchanged in the various age groups, with the exception of the group aged 0-4 years, in which the rate decreased from 10.8 to 5.5 per 1,000 population. The group aged 65 years and over accounted for 43.1% of all deaths in 1990, the under-1 age group for 17%, the 1-4 age group for 4.8%, the 15-44 age group for 14.3%, and the 45-64 age group for 20.8%.

The leading causes of death have also remained basically unchanged over the past several years, although in some cases the rates have increased. In 1983, 1984, 1989, and 1990, heart disease (ICD-9, 390-398, 410-429) ranked first, with the highest rates. Certain conditions originating in the perinatal period (760-779) ranked second in 1989 and 1990, with rates of 0.7 and 0.9 per 1,000 population, respectively. They were followed by diseases of the respiratory system (460-519), cerebrovascular disease (430-438), and hypertension (401-405), all of which showed a rising trend in recent years. Malignant neoplasms (140-208), accidents

(E800-E949), and diabetes (250) also figured among the 10 leading causes of death.

Chronic diseases as a group were responsible for an increasing percentage of total mortality during the period 1976-1988. Taken together, hypertensive diseases, immune and endocrine disorders, ischemic heart disease, cerebrovascular diseases, and malignant neoplasms accounted for 17.9%, 25.9%, and 26.9% of all deaths in 1976, 1986, and 1988, respectively.

The same diseases registered as the leading causes of death at the national level also figured among the six leading causes in each district, with the exception of Toledo and Cayo. In Toledo, the four leading causes were intestinal infectious diseases, nutritional deficiencies, "other diseases of the respiratory system," and congenital anomalies. In Cayo they were "other diseases of the respiratory system," certain conditions originating in the perinatal period, "other accidents," and motor vehicle accidents.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

According to official figures, over the past 20 years the infant mortality rate has shown a downward trend, which was most pronounced during the first of the two decades, when the rate fell from 47.2 per 1,000 live births in 1969-1970 to 23 in 1982-1983. Since then, infant mortality has remained stable, and the rate recorded for 1990 was 22.5.

Information by district for the period 1983-1990 indicates that Belize consistently recorded the highest infant mortality rates, possibly because the only referral hospital in the country is located in Belize City and therefore patients at a high risk of dying were cared for in that district and their deaths registered there. Orange Walk and Cayo reported low infant mortality rates for every year during that period.

Neonatal mortality has remained between 8 and 12 per 1,000 live births in recent years. Postneonatal mortality, however, has shown a rising trend.

The high infant death rates that prevailed up to 1980 were associated primarily with infectious diseases (diarrheal diseases and respiratory infections), followed by perinatal causes. A comparison of the periods 1980-1981 and 1982-1983 reveals that the reduction in infant mortality from 30 to 23 per 1,000 live births was due in large part to a decline in mortality from diar-

rheal diseases and respiratory infections and that there was no change in perinatal mortality.

In 1988 conditions originating in the perinatal period were the leading cause of death among children under 1 year, accounting for 47% of the deaths in that age group. Among the other leading causes were "other diseases of the respiratory system" (18% of the total) and congenital anomalies (7%); 6% of all infant deaths were attributed to signs, symptoms, and ill-defined conditions.

According to estimates based on 1991 census data, infant mortality was 35 per 1,000 live births. Toledo and Stann Creek showed the highest rates, at 54 and 43, respectively, and the district of Belize had the lowest, at 23 per 1,000.

Although by law all deaths must be registered within 4 days in the district in which they occur, an undetermined proportion go unreported, for a variety of reasons.

Medical statistics indicate that 5.5% of all children born countrywide in 1991 weighed under 2,500 g. In the various districts the proportion ranged from 2.1% in Corozal to 7.9% in Belize. Statistics from the hospital in Belize City show that 8.2% of the children born there in 1991 weighed less than 2,500 g. This hospital serves as the referral center for the other five districts.

Among children aged 1–4, official statistics indicate that during the period 1982–1989 the death rate fluctuated between 1.3 and 2.2 per 1,000. A study conducted in 1991 found the highest rates in the districts of Belize, Cayo, and Stann Creek. More than 50% of the deaths in this age group were due to respiratory diseases and dehydration, with accidents, sepsis, and meningoen- cephalitis accounting for the rest.

Between January and March 1992 a nutritional assessment team gathered data from all the health centers in the country. The data were analyzed using the indicator weight-for-age and the WHO classification, with one standard deviation below the norm being used as the cut-off point to define malnutrition. The study data referred only to the population that sought care at the health centers, the characteristics of which may differ from those of the general population. A total of 8,516 children were examined (approximately 28% of the total population under 5 years of age). At the national level, 59.2% of the children were considered to have normal weight-for-age, while 19.2% were classified as slightly malnourished (between –1 and –2 standard deviations from the norm), 4.9% as moderately malnourished (between –2 and –3 standard deviations from the norm), and 1.3% as severely malnourished (more than –3 standard deviations from the norm). An analysis of

TABLE 2
Prevalence of malnutrition in children under 5 years old
(n=8,516), by district, Belize, 1992.

| District | % Malnourished | | | Total |
|-------------|---------------------|-----------------------|---------------------|-------|
| | Slight ^a | Moderate ^b | Severe ^c | |
| Toledo | 29.8 | 13.3 | 2.2 | 45.3 |
| Stann Creek | 16.8 | 5.8 | 1.8 | 24.4 |
| Cayo | 20.0 | 5.1 | 1.4 | 26.5 |
| Belize | 12.4 | 2.8 | 1.1 | 16.3 |
| Orange Walk | 23.6 | 5.5 | 0.6 | 29.7 |
| Corozal | 23.7 | 5.1 | 1.8 | 30.6 |

^aBetween –1 and –2 standard deviations from WHO norm for weight-for-age.

^bBetween –2 and –3 standard deviations from norm.

^cMore than –3 standard deviations from norm.

malnutrition by district is shown in Table 2. In the country as a whole, the most severely affected groups were children aged 1–2 years, followed by those aged 6–12 months. In contrast, 1,222 (14.4%) showed some risk of obesity, and 88 (1%) were classified as obese.

Health of Women

The sources of data on maternal mortality are vital events registers and hospital statistics. During recent years the official reported rates ranged from 3 to 6 maternal deaths per 10,000 live births. In 1989 a review of maternal mortality conducted by the Ministry of Health found rates of 4 to 13 maternal deaths per 10,000 live births during the period 1979–1989. The majority (75%) of the maternal deaths registered in that period were due to direct obstetric causes, including abortion, infection, hemorrhage, toxemia, uterine rupture, and complications of cesarean section.

Subsequent reviews were conducted in 1990 and 1991. In 1990 a maternal mortality rate of 19.9 per 10,000 live births was recorded—the highest since 1979. The district of Corozal had the highest rate (34.7) and Belize the lowest (8.9). The leading cause of maternal mortality was found to be postpartum hemorrhage. The 1991 review revealed a rate of 14.7 and showed the leading causes to be pre-eclampsia and postpartum hemorrhage.

A study carried out in 1989 gathered information for 1 month on 3,860 pregnant women visiting one of 15 health centers for their first prenatal check-up. Information was also obtained from one rural center in each district and from two in the district of Belize. As measured by WHO standards, 40.2% of the pregnant women seen at prenatal clinics were anemic. The districts of Toledo and Cayo showed the highest preva-

lences, at 47.3% and 47.1%, respectively, and Stann Creek had the lowest, at 24.3%. The districts of Belize, Corozal, and Orange Walk had almost identical levels: 38%, 39%, and 39%, respectively.

Health of Special Groups

Disabilities related to eyesight are the most prevalent type, according to the 1991 census, in which 14.1% of the population reported some disorder affecting vision. Disabilities relating to the lower limbs are more common in urban areas.

Studies carried out among Garífuna and Ketchi Maya ethnic groups have revealed iron and vitamin A deficiencies.

Diseases and Health Impairments

Vaccine-preventable Diseases

The last case of poliomyelitis in the country was reported in 1980. Measles cases decreased dramatically between 1980 (when 607 cases were reported) and 1991 (10 cases), although a rise in the number of cases was noted in 1986 (124 cases). Four cases of diphtheria were diagnosed in 1982 and one in 1987. The last reported case of neonatal tetanus occurred in 1987. In 1991 only four cases of whooping cough were reported.

Vector-borne Diseases

In 1992, 4,630 cases of malaria were identified out of a total of 24,135 blood samples examined. *Plasmodium vivax* was found in 96.6% of the cases and *P. falciparum* in the rest. In April an epidemic caused by *P. falciparum* occurred in Stann Creek, and that district along with Cayo reported the highest number of cases that year. The working population aged 15–44 years had the greatest risk of contracting the disease in these two districts, which receive large groups of migrant workers from neighboring countries. The district of Toledo, which also receives migrants from Guatemala, reported 777 cases. *Anopheles pseudopunctipennis* is the most frequent vector.

Chagas' disease and schistosomiasis are both present in the country.

Rickettsiosis was among the leading causes of hospitalization in the district of Toledo during 1990–1991.

Cholera and Other Intestinal Infectious Diseases

In 1992 Belize had 159 confirmed cases of cholera and four deaths from the disease. The first three cases were detected in the district of Toledo (Punta Gorda) in January, but no further cases appeared until August. The highest number of cases (52) was recorded in September. The district of Toledo was hardest hit, with 120 cases and two deaths for an annual incidence rate of 7 per 1,000. This district has poorer access to safe drinking water and sanitary means of excreta disposal than the rest of the country.

According to a survey of family health carried out in 1991, 11% of children under 5 years of age had experienced diarrheal disease during the 2 weeks prior to the family's interview. The incidence was highest among children in the first 2 years of life and was slightly higher in rural areas than in urban areas. The Ketchi Mayas, mestizos, and Garífunas were the ethnic groups most affected. The frequency of diarrhea cases decreases markedly among children after their third birthday. In general, the incidence of diarrhea among children decreases as the educational level of the mother rises.

In 1988, 70% of the reported diarrhea cases occurred in children under 5 years of age. Intestinal infections ranked fourth among the leading causes associated with hospital discharge (excluding normal delivery) in 1990 and 1991. The majority (59.3%) of diarrhea deaths occurred among infants between 28 days and 11 months of age.

Acute Respiratory Infections

In the same 1991 survey, 41% of the mothers of children under 5 years indicated that their children had exhibited signs or symptoms of ARI in the 2 weeks preceding the interview. The highest percentages were found in urban areas among children under 2 years of age whose mothers had low educational levels. Of the children who had shown symptoms of ARI, 86% had been treated, 41% having received care at public or private health care facilities and 2% having been taken to traditional healers. The Ketchi Mayas are most inclined to seek treatment from traditional healers.

Rabies

Two cases of human rabies were reported in 1989.

AIDS

The cumulative total of AIDS cases reported up to 1992 was 65 (68% acquired through heterosexual transmission). One case was notified in 1987, 5 in 1986, 10 in 1988, 8 in 1989, 8 in 1990, 11 in 1991, and 22 in 1992. Belize City, the country's principal commercial center, has recorded a total of 38 cases. The next highest number (8 cases) has been registered in the district of Cayo, which is the largest in terms of area and population. AIDS has spread to every district in the country.

The cumulative total of known seropositive individuals is 205. The number of HIV-infected persons has risen steadily. Most of the infected population is concentrated in the districts of Belize and Cayo.

Malignant Neoplasms and Cardiovascular Disease

In 1987 malignant neoplasms accounted for 10.6% of all deaths from defined causes, and diseases of the circulatory system accounted for 24.7%. The proportion of deaths from these two groups of causes was similar in both sexes; 61% of the deaths occurred in the group aged 65 years or older.

Accidents and Violence

The group of external causes (accidents and violence) accounted for 12.1% of all deaths from defined causes in 1987. Of these deaths, 75% occurred in males.

Risk Factors

Housing

According to the 1991 census, the country had a total of 38,000 housing units—a 35% increase over the number found in the 1980 census (28,000).

Of the total number of "family" dwellings—defined as a place in which several persons spend most nights of the week and eat at least one meal together—22% are homes headed by a female. More than 50% of the family dwellings house five or more people (56% in rural areas and 45% in urban areas), and only 22% house fewer than three.

Some 63% of the dwellings in the country have two or fewer bedrooms, which would appear to indicate overcrowding, considering that the average number of persons per family is over five. Approximately 66%

of all dwellings are owned by their occupants and 22% are rented; in urban areas, 57% are owned and 37% rented.

The most common roofing material used in the country is zinc sheet metal. Wood is the most commonly used material for walls and floors, although concrete is also widely used for outer walls and floors. In the early 1980s, 59% of dwellings nationwide had electricity, and that proportion had risen to 67% by 1991 (94% in urban areas and 40% in rural areas). At the district level, only 25% of the housing units in Toledo (the district in which conditions lag farthest behind) had electricity. The proportions in other districts ranged from 48% in Stann Creek to 88% in Belize.

Pesticide Use

The following risks have been noted: incorrect and excessive pesticide use, lack of knowledge about safe use on the part of farmers, insect resistance to certain pesticides, environmental contamination, improper storage and labeling of pesticides, lack of facilities for analysis of pesticide residues, and lack of adequate facilities for the disposal of contaminated waste and packaging materials. Action has been taken to regulate pesticide use in the country.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

The Government recognizes health as an essential part of the development process and acknowledges its own role in ensuring that all citizens have access to the best possible health care, regardless of ethnic origin, religion, socioeconomic level, or jurisdictional or geographic area of residence. It is understood that providing access to health care is an intersectoral undertaking and that health services by themselves cannot improve health conditions, which depend heavily on other social and economic programs.

The Ministry of Health is headed by the Minister, who is responsible to the Cabinet for all services provided. The Permanent Secretary is the executive head of the Ministry and is in charge of administration for all sections of the services, while the Director-General of Health is responsible for all the technical aspects. The Administrative Support Division is under the responsibility of the Permanent Secretary and carries out

functions related to planning and research, maintenance, personnel, and finance.

The country's Health Plan is part of its Development Plan, which covers a 4-year period.

The Ministry of Health has embraced the primary health care strategy, and accordingly it has created an infrastructure of district health teams, which are organizations that work toward common health-related goals. In order to facilitate the work of these district teams, executive committees have been organized to implement health plans and monitor their progress. Additionally, people's health committees have been created as a vehicle for community participation in health activities. The necessary responsibility and authority are delegated to the physician who serves as the District Director and to the district executive committee.

Public spending on health is equal to 3% of the GDP and accounts for 10% of the national budget. After doubling between 1978 and 1981, the health budget has remained more or less stable. The amount allocated for primary health care represents 20% of the total, while the amount devoted to hospitals (national and district) is between 45% and 50%.

Health education is recognized as the basis for all community-oriented programs. The Office of Health Education and Community Participation within the Ministry of Health is responsible for carrying out the national plan for health education and community participation.

Organization of Services

Personal Health Care Services

Government facilities are the principal providers of health care in the country's six health districts. Approximately 88% of the population has access to the health services offered through this network.

The basic public sector infrastructure of health care consists of 34 health centers, 17 health posts, and 7 hospitals with a total of 388 beds (2.2 per 1,000 population). Mobile clinics staffed by two or three nurses help to increase coverage, providing services to 165 communities, which they visit every 6 weeks.

In 1990 the Belice Hospital, which serves as the referral center for the entire country, had 47% of the total hospital beds available and accounted for 57% of all admissions.

In the private sector there are two hospitals, one in Belize City and the other in the district of Cayo.

In regard to human resources in the health services, problems have been identified in relation to the availability of physicians in the public sector, medical productivity in that sector, and the availability of qualified nurses. In 1989 the records of the Office of Medical Statistics of the Ministry of Health showed 95 registered physicians (5.2 per 10,000 population) practicing in public and private institutions. Approximately half (45) were in private practice or were specialists working in both the private and public sectors. Seventeen of the licensed specialists were practicing in the district of Belize, 13 of them in Belize City. The private medical sector primarily provides outpatient services.

According to the Ministry of Health, in 1989 there were 13 registered dentists, 211 (12 per 10,000) graduate nurses, 114 (6.3 per 10,000) midwives, and 42 (2.3 per 10,000) nursing auxiliaries.

The distribution of human resources by district varies considerably. Toledo, for example, has the fewest doctors and nurses, and Cayo has the fewest dentists. Each district, with the exception of Stann Creek, has at least two public-sector medical officials—the District Director and another physician. All the hospitals, except the San Ignacio hospital in the district of Cayo, have at least one specialist, generally a pediatrician or a gynecologist. Two-thirds of the hospitals have a dentist, and only the district of Cayo lacks professional dental services in the public sector. The Dangriga hospital in Stann Creek has the fewest nurses.

A social security statute was enacted in 1979 and the Council on Social Security was established in 1981. The members of the Council are appointed by the Minister of Finance, who consults with employers and employees on the selection of candidates. Any change in social security benefits, contributions, or regulations must be approved by the Minister of Finance. The social security system comprises three types of funds: a short-term fund, a long-term fund, and a fund for work-related accidents. These funds, which are financed through employer and employee contributions, pay cash benefits at retirement and in the event of illness, maternity, work-related accidents, and disability. The system covers medical care only when it is related to occupational accidents or diseases. Under the 1979 statute, participation is mandatory for all employers and public-sector wage-earners, as well as for private-sector employees aged 14–65, who make up about 70% of the full-time work force. The system does not cover members of the armed forces, part-time workers, temporary workers, or domestic workers. Seasonal workers receive full coverage while they are

under contract during harvest season. Employees over the age of 65 are covered only against injury. Dependents of social security beneficiaries are not covered.

The migrant populations in the country pose a problem in regard to health services coverage, since communities of a few families tend to spring up suddenly in remote areas and move or disappear just as suddenly. In addition, there is a continual flux of people across the borders in both directions.

It is recognized that there is less utilization of health services among populations with low levels of income and education.

According to the family health survey conducted in 1991, a very high percentage (97%) of the Belizean population is familiar with at least one modern method of contraception. The most widely known method is oral contraceptives. Of the women aged 15–44 in the country, 40% use oral contraceptives. Women in rural areas, those with little formal education, and Ketchi Maya women were found to be least familiar with contraceptive methods. Among the reasons cited for not using contraceptives was fear of side effects that would interfere with future pregnancies or with normal sexual relations.

In 1991 the maternal and child health program had a coverage level of 80% for prenatal care. The highest coverage was in the district of Cayo (92%), which was followed by Orange Walk (91%) and Stann Creek (90%); the district of Belize had the lowest coverage (67%). This high level of prenatal care coverage at the national level is reflected in the findings of the 1991 family health survey, which indicated that 95% of the women who had given birth to live-born infants during the 5-year period covered by the survey had received prenatal care during pregnancy. This percentage includes women who received prenatal care from private sources, although public facilities were the main providers of such care.

The study also showed that 50% of the women who received prenatal care had their first examination during the first trimester of pregnancy, and the remaining 50% had their first visit during the second trimester. It was reported that 75% of the women received five or more check-ups during pregnancy. Women living in urban areas and those with the highest levels of education had more prenatal visits than women in rural areas and those with less education. Pregnant women in the Creole population and "other" ethnic groups had more prenatal visits than those in other groups.

The 1991 family survey revealed that 84% of pregnant women received at least one dose of tetanus toxoid. Official data from the Ministry of Health for that

year indicate that 76% of births took place in health institutions and one-fifth were attended by traditional birth attendants.

Packets of oral rehydration salts (ORS) are available through all government health clinics. According to the 1991 survey, 33% of the children in the families interviewed had received ORS during their most recent diarrheal episode. However, if the number of children who received homemade salt-sugar solutions is added to the number who were given ORS solution, the proportion receiving oral rehydration therapy rises to 44%. Children in rural areas and children of mothers with little education were most likely to have been treated with antibiotics. Mothers in urban areas and mothers with high levels of education tended to treat their children with ORS or solutions prepared in the home.

The Expanded Program on Immunization has been operating in the country through the maternal and child health services since 1979. Immunization coverage among children under 1 year old has risen slowly but steadily since 1984. A national vaccination campaign in 1986 boosted coverage levels considerably. Coverage declined slightly in 1987 but has increased since then. In 1991 coverage levels were 80% for the measles and polio vaccines, 84% for DPT, and 80% for BCG.

Public dental services are provided in five of the six districts. In 1988 a total of 7,862 adults and 3,704 children were treated by these services; 80% of the children had teeth extracted. Private dental services are also available throughout the country. Most of the dental care provided consists of extractions and oral health education.

All the districts have an oral health education program for schoolchildren aged 5–13. The school health services in all the districts provide free dental hygiene and treatment for schoolchildren.

Rabies control activities are managed by the Office of the Public Health Inspector, in cooperation and coordination with the Veterinary Section of the Ministry of Agriculture.

Laboratory services are provided through the government's central laboratory and a small laboratory in the hospital in Belize City. Some laboratory services are also available in the districts.

Environmental Services

In urban areas 92% of the population has access to a water supply (89% through house connections and 3% through an easily accessible source). In rural areas the proportion is 51%. A widespread problem is contami-

nation by fecal bacteria from latrines located too close to water sources.

There are two laboratories capable of conducting water quality tests, both located in Belize City. One is affiliated with the Ministry of Health and the other is operated by a water and sanitation company. Both carry out physical, chemical, and bacteriological testing.

The Ministry of Health is responsible for supplying safe drinking water (treated surface water or untreated but safe water from protected sources) in sufficient quantities for the population, and it also provides advice on the selection of appropriate sites for the construction of wells and on laboratory testing. In practice, the Ministry's role is limited to monitoring the quality of water from public sources in rural areas, which includes water from hand pumps and rudimentary water systems. The water and sanitation company tests water samples from municipal water systems.

Regular water quality testing is conducted throughout the country on a monthly basis, and reports are

submitted to the public health inspector. Testing has been stepped up since the first case of cholera was reported in January 1992. Public health inspectors apply chemical substances and take samples in the field. In urban centers routine sampling is performed to determine levels of residual chlorine.

The main problem in regard to provision of the services described above is difficulty of access to some rural areas, particularly in the district of Toledo.

Excreta disposal services cover 73% of the urban population (44% has connections to the public system and 29% has latrines or septic tanks) and 21% of the rural population (through latrines or septic tanks).

The Office of Public Health, under the Ministry of Health, has a food safety program targeting both prepared and raw foods. Health inspectors collect samples from restaurants and street-food stands and check them to ensure the food is safe for consumption. The central laboratory conducts bacteriological testing of samples suspected of being contaminated.

BERMUDA

GENERAL HEALTH SITUATION AND TRENDS

Bermuda is an island of about 60 km² situated in the Atlantic Ocean about 970 km off the coast of the state of North Carolina, United States of America. It is a British Crown dependent territory.

The island has virtually no natural resources and must import essentially all of its consumable goods and energy sources. Nevertheless, the country usually shows a balance of payments surplus generated by an economy based on tourism and international business enterprises. Inflation was running about 6% annually at the end of the 1980s. Unemployment is negligible. Two-thirds of jobs are in services such as wholesale and retail trade, restaurants, and hotels, as well as community, social, and personal services. Per capita annual income is over US\$ 20,000.

Health and Living Conditions

Living standards are high. Health and medical care is of good quality, widely available, and easily accessible. Housing, transportation, and communications are adequate. Literacy is about 97%, supported by free, compulsory education up to the age of 16.

Population

The 1991 population was estimated at 58,460, which was 160 fewer persons than in 1988. The decline is explained by emigration and a slight reduction of the annual natural growth rate, from 1% to 0.7%.

After declining until 1980, the crude birth rate has increased marginally in recent years, from 14.6 per 1,000 inhabitants in 1980 to 15.9 in 1988, 15.2 in 1990, and 16.4 in 1991. The number of births during the 4-year period 1989–1992 was 3,693; births averaged about 925 per year during the period, and the number increased each year, rising from 893 in 1989 to 953 in 1992. Crude death rates have shown a similar pattern:

7.3 per 1,000 inhabitants in 1980, 7.5 in 1990, and 8.1 in 1991. Life expectancy at birth in 1991 was 76 years for females and 69 years for males.

Proportionate age segments of the population remained relatively stable, with about 20% under 15 years old and 9% age 65 and over.

Morbidity and Mortality

The two major causes of morbidity and mortality remain unchanged since the mid-1980s. Cardiovascular disease accounted for 193 deaths in 1991, for a rate of 3.3 per 1,000 population, compared to 3.6 per 1,000 in 1983. Deaths from malignant neoplasms totaled 118, for a rate of 2.0 per 1,000, compared to 1.5 in 1988. Diseases of the respiratory tract, which ranked third in 1988 (0.4 per 1,000), has been replaced by AIDS and AIDS-related conditions, with a rate of 0.5 per 1,000. In 1991, 27 deaths were AIDS-related.

The three most frequent diagnoses upon admission to a hospital are alcoholism, respiratory illnesses, and accidents. The rates of hospital admissions and deaths resulting from traffic accidents have declined in recent years as a result of successful campaigns against drunk driving, the introduction of breath-alcohol testing, strong police action, and heavy fines for speeding.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

The proportion of births less than 2,500 g was 4.1% (39 births) in 1991 and 7.0% (67 births) in 1992, or 5.6% over the 2 years.

No deaths within the neonatal period (under 28 days) were recorded for 1992. In 1991, four neonatal deaths resulted in a neonatal death rate of 4.2 per 1,000 live births. Neonatal deaths over the 4-year period 1989–1992 averaged 3.8 per 1,000 live births.

The infant mortality rate was 6.7 per 1,000 live births in 1989 (six deaths), 7.8 in 1990 (seven deaths), and 4.2 in 1991 (four deaths). For the 3-year period 1989–1991 the average yearly infant mortality rate was 6.2. There were no infant deaths in 1992. The majority of infant deaths occur in the neonatal period: 14 out of a total of 17 infant deaths in 1989–1991. The main causes of hospitalization of infants under 1 year old are asthma, intestinal infectious diseases, and diseases of the respiratory tract.

There are no readily available data on death rates of children 1–4 years old. The main causes of death in this population are cerebral palsy, sepsis, and pneumonia. Hospital admissions in the 1–4-year-old age group are mainly due to asthma, convulsions, and diseases of the respiratory tract.

Health of Adolescents, Adults, and the Elderly

Alcoholism, drug abuse, sexually transmitted diseases, and accidents are significant public health concerns. In 1991, 25 new cases and 27 deaths from AIDS were reported.

In 1992, 74 (7.8%) of 953 total births were to mothers 16–19 years old and 3 (3.1%) to mothers under 16 years. In 1991, 95% of pregnant women received prenatal care either from a government clinic or a private physician, and 99% were fully immunized against tetanus. All births took place in hospitals or were attended by trained personnel.

Cardiovascular disease, cancer, respiratory disease, accidents, and violence are the main causes of morbidity. Cardiovascular disease accounts for over 50% of all deaths, while deaths due to cancers rank second.

Diseases and Health Impairments

Seven imported cases of *malaria* were reported over the period 1989–1992, with the highest number (three) in 1990. No cases of *dengue fever* or *yellow fever* were reported.

There were no reported cases of *measles*, *poliomyelitis*, *diphtheria*, *tetanus*, *whooping cough*, or *acute flaccid paralysis* in 1992. Four *rubella* cases were reported in 1992, bringing the total for the period 1989–1992 to 11. During the same period there were four reported cases of measles. Immunization coverage of children under 1 year old for diseases included in the Expanded Program on Immunization was reported to be 80% for 1991. However, coverage fell in 1992 (see Table 1).

TABLE 1
Immunization coverage (percent) among children under 1 year old, Bermuda, 1989–1992.

| Year | Target population (No.) | Type of immunization (% coverage) | | |
|------|----------------------------|--------------------------------------|-----|-----|
| | | DPT | OPV | MMR |
| 1989 | 895 | 74 | 76 | 67 |
| 1990 | 883 | 62 | 62 | 63 |
| 1991 | 883 | 82 | 82 | 84 |
| 1992 | 960 | 76 | 77 | 71 |

Source: Caribbean Epidemiology Center, EPI report.

No cases of *cholera* have been reported, but there were 64 cases of *gastroenteritis* in children under 5 years old in 1992.

There were 7 reported cases of *tuberculosis* in 1992, bringing the total for the period 1989–1992 to 12. Ten of the 12 cases were seen in the last 2 years of the period.

In 1991 and 1992 the reported cases of *influenza* remained about constant—1,893 and 1,873, respectively.

Although *sexually transmitted diseases* have been recognized as a concern by the Government, data on their prevalence and incidence are not readily available. During the period 1982–1992, 218 AIDS cases and 177 deaths were recorded; 118 of these cases (54.1%) occurred in the 4-year period 1989–1992. The male-to-female ratio is 3.7:1. The majority (76%) of the AIDS cases are in the age group 25–44 years. Intravenous drug abuse is the most frequent risk factor, with 104 cases (47.7%) being attributed to that mode of transmission. Male homosexual behavior was implicated in 50 cases (22.9%), and heterosexual transmission in 38 cases (17.4%).

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

The national health policy emphasizes maternal and child health; health of school-age children; community nursing care for the elderly; dental health; control of communicable diseases, including AIDS prevention and control; mental health; and alcohol and drug abuse control and prevention. Population groups designated for special attention include mothers and infants, school-age children, and the elderly. Responsibility for implementing the policies and assuring the general health and welfare of all Bermuda residents rests with the Ministry of Health and Social Services.

The Ministry controls, coordinates, and delivers its services through departments of health, social services, and prisons. Each department is responsible for its own operation under the authority of the Permanent Secretary and the direction of the Chief Medical Officer, the Director of Social Services, or the Commissioner of Prisons.

A Joint Planning Committee chaired by the Minister of Health and Social Services reviews all major expenditures for public health, hospitals, social service programs, and prisons. Recently program managers have been given greater responsibility and authority for financial matters as a result of the decentralization of the budgeting process. In matters of health, the Ministry of Health and Social Services is responsible for health planning, programming, budgeting, and evaluation. It is also responsible for the overall policy of the Bermuda Hospitals Board, a statutory body of seven members appointed by the Minister to administer the King Edward VII Memorial (general) Hospital and the St. Brendan's (psychiatric) Hospital.

Organization of Health Services

The Ministry administers public health clinics, which encompass the immunization program; provides routine health examinations in schools and nurseries; supervises the monitoring of food safety and drug distribution; undertakes environmental health inspection and quarantine services; provides general health care in penal institutions and for the police; and delivers educational information and reports to the public on disease prevention and health promotion. Specifically, the Department of Health is responsible for public health, disease prevention, and health promotion services. For administrative purposes, public health programs are divided into sections, according to the service provided. The Department's units are personal health services, dental health services, environmental health services, and the public health laboratory.

Personal Health Care Services

Public health activities include maternal and child health services, school health programs, immunization, communicable disease control, home health care (including health visiting, district nursing, and selected specialized care), health education, and health promotion. Private voluntary agencies support and assist the Government in providing some of these services.

The Department of Health operates 10 health centers to serve the 12 health districts into which the island is divided. These health centers deliver antenatal, post-natal, and child health services, including immunization, and a preventive dental care program for infants and children that provides fluoride treatment. School-children receive both preventive and curative treatment free of charge.

The King Edward VII Memorial Hospital has an installed capacity of 234 beds in private, semi-private, and public wards, and 90 geriatric and rehabilitation beds. This institution provides an array of medical and surgical services as well as specialized intensive care and oncology units. Referral for treatment or services unavailable in Bermuda is most commonly made to the United States of America, Canada, or the United Kingdom.

In 1991 the ratio of general hospital beds to population was 4 per 1,000, there were 13.8 hospital discharges per 1,000 inhabitants, and the average length of stay was 8.7 days, a figure that declined by a full day during the year. Average occupancy of the hospital was 79.3% in 1991.

Hospitalization is provided free of charge to children up to 18 years or those attending school full time, while patients over the age of 65 receive subsidies to cover 75%–100% of their hospital charges. The Government subsidizes the costs incurred by the few indigent patients. Most other hospitalizations are covered by insurance, which is mandatory for all employed persons.

St. Brendan's Psychiatric Hospital, which provides care and treatment for the mentally ill and mentally handicapped, has a capacity of 166 beds.

Skilled nursing care facilities include Lefroy House, which has 57 beds, and the Extended Care Unit, with 89 beds. Privately operated personal care homes (nursing homes) provide limited nursing care and personal services, while domiciliary care homes provide room and board and some assistance with personal services. In 1991 a hospice facility for the terminally ill was opened.

Hospitals in Bermuda receive periodic accreditation reviews by the Canadian Council on Hospital Accreditation.

Bermuda supports a substantial number of private, mostly individual, general and specialty medical practices. In 1991 there were 71 physicians (12.1 per 10,000 population), 27 dentists (4.6 per 10,000), 523 nurses (102.6 per 10,000), and 6 veterinarians. The high ratio of physicians to population (with 57% of registered physicians providing primary care), along with mandatory hospitalization insurance for employed

people, shared equally by the employer and the employee, allows good access to health and medical care.

No medical schools or graduate medical education programs exist on the island. However, continuing medical education is required for hospital-based physicians.

Environmental Services

The entire population is served by both potable water piped into the home and sanitary waste dis-

posal. Strict building codes apply to all construction projects, particularly with regard to plumbing, sewage disposal, and water supply. Solid waste collection and disposal are carried out by the Government's public works department. Incinerator plants are used, and marsh reclamation and landfill creation are ongoing.

There is growing concern over shoreline pollution by oil, groundwater pollution by pesticides, and air pollution caused by automobile and airplane emissions—any or all of which may have an impact on the health of the population as well as the pristine beaches and waters.

BOLIVIA

GENERAL HEALTH SITUATION AND TRENDS

Bolivia has a land area of 1,098,581 km², of which 25% is mountain ranges and high-altitude flatlands (the altiplano), 15% of which is inter-Andean valleys, and 60% of which is plains. Forty-five percent of the population lives in the altiplano, 30% in the valleys, and 25% in the plains. Each region's situation is very different in terms of form of social organization, profile of morbidity and mortality, and access to goods and services. The country has nine departments, but regional autonomy is a growing force.

The year 1985 saw a series of far-reaching structural changes. In the political arena, parliamentary democracy was finally being practiced freely after years of dictatorships and authoritarian regimes, while in the economic sphere structural reforms included the privatization of State enterprises, the institution of a free exchange rate, and the introduction of measures to control the fiscal deficit. As a consequence, the public sector's nonfinancial deficit was reduced from 25.5% of the GDP in 1984 to 2.6% in 1986. At the same time, inflation dropped to 12% in 1985 and stood at 16% in subsequent years. The impact of the reforms and structural adjustment was especially harsh on the poorest sectors, and it added to the ranks of those living in conditions of poverty and social marginalization. The changes also served to shift the distribution of the economically active population: the numbers of peasant farmers and traditional mine laborers decreased, while the informal sector climbed to an estimated 58% of all urban workers.

Health and Living Conditions

According to the 1992 census, water supply reached 84% of the urban homes, attaining levels as high as 92% in some cities (Tarija and Oruro), while about 50% had the benefit of sanitation services. In rural areas, access to water ranged from a low of 4% in the department of Beni to a high of 33.6% in the department of Santa Cruz, averaging 24% for the country as a whole.

Electric power was being furnished to 87% of urban households (68% in Beni, 90% in the departments of Potosí and Oruro) but only 15% of those in rural areas (ranging from 6% in Chuquisaca to 23% in the department of Cochabamba). There are striking differences between the older, more central urban neighborhoods, which are relatively well served, and the new settlements on the urban outskirts, where the increase in service delivery has failed to keep pace with population growth. At the same time, the rapid growth of the cities makes for a less stable habitat: only half the heads of household are homeowners, compared with 85% in rural areas. In addition, the average number of persons living under one roof has risen in the cities to 4.2, compared with 3.3 in the countryside.

Data from the 1992 census indicate that the illiteracy rate in the population 15 years of age and over fell from 35.8% in 1976 to 20%, with sizable variations from one department to another. The rates were higher among women than among men, and in rural areas than in the cities; on average, illiteracy was 13 times more prevalent among women in rural areas than among men in urban areas. In the department of Cochabamba the difference was by a factor of 16.8.

Population

According to the National Population and Housing Census conducted in 1992, the country had 6,344,396 inhabitants. The population grew at an average annual rate of 2.11% during the period between the 1976 and the 1992 censuses, whereas between the censuses of 1950 and 1976 the growth rate had been 2.05%. The population density was 5.84 inhabitants per km², varying between departments from 0.6% in Pando to 19.9% in Cochabamba. The population growth has not been uniform: it has tended to be high in the departments of Santa Cruz (4.16%), Beni (3.16%), and Tarija (2.82%), whereas Potosí has been losing population at a rate of 0.12% per year. In general, the departments in the central and eastern part of the country have gained population at the expense of the altiplano.

The urban population represented 58% of the national total. Urbanization in Bolivia has largely consisted of rapid growth in the three major metropolitan areas—La Paz, Santa Cruz, and Cochabamba—which together had a population of 2,322,083, or 37% of the country's total. The 112 towns and cities with 2,000 to 200,000 inhabitants were home to only 21% of the population.

Females constituted 50.6% of the total population. Persons under 15 years represented 42% of the population; the 15-to-44 age group, 54%; and those over 60, approximately 4%. In urban areas the proportions corresponding to these three age groups were 39%, 57%, and 4%, respectively, whereas in rural areas they were 44%, 50%, and 6%. According to the 1992 census, the general fertility is estimated at 5 children per woman, reflecting a decline of more than one child per woman in the last decade. The rate ranged from 4.2 children per woman in urban areas to 6.3 in rural areas. The rates in the various departments ranged from 4.2 in La Paz to 6.8 in Pando. These rather high rates stand in contrast to a relatively moderate rate of population growth, which is affected by mortality and also by phenomena such as emigration to other countries. Although the migratory flow has not been measured precisely, it may be estimated that more than 10% of the population lives outside Bolivia.

According to data supplied by the National Institute of Statistics (INE), the economically active population numbered 2,530,409 in 1992. Figures for unemployment ranged between 9% (from official data) and 24% (according to the Church and the workers' union, Central Obrera Boliviana).

The indigenous population, estimated at over 3.6 million, comprises 36 known ethnic groups, although a sizable proportion is Quechua and Aymara. These groups have recently joined together in a peaceful movement for the principal purpose of defending their land rights. Most of these peoples are politically, economically, socially, and culturally segregated, which makes them more vulnerable to disease and death. Curative care in this sector of society is based on traditional medicine. The ecological imbalance produced by outside forces within the territory of these groups is another factor that has added to their risks in recent years, especially in the eastern part of the country.

Mortality and Morbidity

There are major deficiencies in the registration of vital statistics. People have to pay to register births and

deaths, and it is believed that these events are greatly underreported. At the same time, it is estimated that only 20% of the deaths are certified by a physician. There is no mortality information subsystem, and no information is available at the national level on causes of death.

Moreover, there are no general information systems on morbidity, causes of consultations, or hospital discharges, and no national morbidity surveys of the population have been carried out. The only data available are figures on diseases for which notification is compulsory and on health problems that are addressed by existing control programs. Such information is usually obtained from the Ministry of Welfare and Public Health (MPSSP) and, in some cases, from the Social Security Institute.

According to the 1992 census, the crude mortality rate was estimated at 18.6 per 1,000 population—16.7 per 1,000 in the urban areas and 21.3 per 1,000 in the rural areas. In 1991, 35.4% of the deaths were in children under 1 year of age (32.7% in urban areas and 38.3% in rural areas); 18.1% were in the 1–4-years age group (15.2% and 21.1%, respectively); 5.6% in the group aged 5 to 14 years (4.4% and 6.9%); 13.1% in the population 15 to 44 years old (14.4% and 11.7%); 11.0% in the age group 45 to 64 years (13.4% and 8.6%); and 16.7% in persons 65 years and over (19.8% and 13.5%).

The 1976 census estimated infant mortality at 151 per 1,000 live births, while data from the 1992 census indicate that by the beginning of the 1990s this figure had been reduced to 75 per 1,000. There were wide variations in this indicator from one part of the country to another: the department of Tarija had the lowest rate (60 per 1,000), down 53.5% from the rate estimated for 1976, while the department of Potosí had the highest rate (118 per 1,000), which nevertheless had fallen 38.2% since the previous census. The greatest drop was seen in Cochabamba, where the rate fell from 174 to 78 per 1,000 live births, or 55.2%, while the least change was observed in Beni, where the rate decreased by 21.1% and was still 90 per 1,000. Urban infant mortality was 58 per 1,000 live births, whereas in rural areas the figure was 94 per 1,000.

Table 1 shows mortality in infants and children under 5 years by urban or rural location and by department. It illustrates the wide variations between departments, the risks being much greater in the rural areas.

The leading causes of death in children, according to the 1989 National Population and Health Survey, continued to be diarrheas and pneumonias. Diseases preventable by vaccination were no longer on the list of leading causes.

TABLE 1
Mortality in infants and children under 5 years, by urban or rural area and by department, Bolivia, 1991.^a

| Total for the country/ departments | Urban rate | | Rural rate | | Total | |
|---------------------------------------|------------|--------|------------|--------|-------|--------|
| | <1 yr | <5 yrs | <1 yr | <5 yrs | <1 yr | <5 yrs |
| Bolivia | 58 | 85 | 94 | 146 | 75 | 113 |
| Chuquisaca | 52 | 82 | 100 | 149 | 88 | 132 |
| La Paz | 63 | 101 | 81 | 136 | 70 | 115 |
| Cochabamba | 56 | 97 | 94 | 163 | 78 | 135 |
| Oruro | 103 | 157 | 123 | 156 | 113 | 155 |
| Potosí | 98 | 136 | 129 | 186 | 118 | 168 |
| Tarija | 46 | 74 | 74 | 118 | 60 | 96 |
| Santa Cruz | 46 | 59 | 78 | 118 | 57 | 76 |
| Beni | 77 | 125 | 109 | 177 | 90 | 146 |
| Pando | 60 | 95 | 88 | 135 | 85 | 131 |

^aBoth rates calculated on the basis of live births in 1991.

Source: National Institute of Statistics, National Population and Housing Census, 1992.

This same survey estimated maternal mortality at 33.2 per 10,000 live births. This figure is consistent with statistics from hospitals of 10.3 per 10,000 hospital deliveries, which represent about 25% of all deliveries (these statistics include stillbirths but not multiple births).

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

The National Health Information System (SNIS) reports that 42.3% of pregnant women obtained prenatal care from the health services in 1991 and 52.2% in 1992. Early coverage—i.e., before the fifth month—was 36.0% and 39.1%, respectively, in those same years. However, the proportion of women who had the recommended minimum of four checkups was only 17.7% in 1991 and 19.7% in 1992.

The incidence of low birthweight was 5% of all hospital deliveries in 1991 and 6% in 1992, with variations ranging from 3% in the department of Cochabamba to 10% in Chuquisaca. In-hospital perinatal mortality was 32.4 per 1,000 births in 1991 and 33.5 per 1,000 in 1992, while in-hospital maternal mortality fell from 17.8 to 11.0 deaths per 10,000 live births.

Coverage of growth and development monitoring is low, and only 33% of children under 2 years have even one checkup. According to the SNIS, the percentage of children under 2 who were not gaining sufficient

weight dropped from 29% in 1991 to 24% in 1992. In 1991 more than 40% of the children in Cochabamba, El Alto, La Paz, and Potosí were in this condition. In 1992 over 30% of the children in the departments of Beni and Oruro failed to gain sufficient weight. In the department of Santa Cruz the proportion of children under 2 years who were not gaining sufficient weight rose from 12% to 22% between 1991 and 1992.

Measles is the only vaccine-preventable disease that continues to be a major problem in children. Its incidence in 1992 was 319.4 per 100,000 in infants under 1 year and 163.0 among children aged 1 to 4.

Acute diarrheal diseases are the leading cause of death in children. It is estimated that each child has an average of six episodes of diarrhea per year and that every year 13,000 children under 5 years of age die from this cause. In hospitals, the case-fatality rate for diarrhea in children under 5 was 8% in 1991 and 5% in 1992, with wide variations between departments—for example, 24% in 1991 and 14% in 1992 in Cochabamba, compared with 4% in 1991 and 2% in 1992 in Beni.

Acute respiratory infections are reported more commonly than diarrheal diseases but cause less mortality. Deaths from pneumonia are estimated at 11,000 per year. Based on hospital figures, the national case-fatality rate for pneumonia in children under 5 was 12% in 1991 and 10% in 1992; in the department of Cochabamba the rate reached 42% and 41%, respectively.

A breakdown of infant mortality shows that the leading causes are acute diarrheal diseases, pneumonias, other acute respiratory infections, and neonatal tetanus.

Ninety percent of all newborns are breast-fed during the first 3 months of life. Two-thirds of the children 12 to 17 months of age are breast-fed, as are more than one-third of those aged 18 and 19 months. The average duration of breast-feeding is 16 months.

Workers' Health

There are six social security funds, and one of them reported 1,085 accidents leading to disability in 1986.

According to the Occupational Health Institute, the prevalence of silicosis among miners was 7.6% in 1981–1983. The proportion with silicotuberculosis during that same period was 1.3%.

Studies conducted in foundries revealed above-normal levels of lead in the blood of 48.5% of the workers examined, while 70.0% and 53.7% of the same population showed excessive levels of mercury and ar-

senic, respectively, in the urine. Among workers handling vaporizers, blood lead levels were above safe limits in 11.5%, while the level of arsenic in urine was elevated in 2.7%. For those working with hydrocarbons, unacceptable blood lead levels were found in 0.8%, and blood mercury levels were excessive in 7.0%. In the manufacturing sector the main problems were organic particulates (36% of the workers exposed), noise (51%), and toxic gases and fumes (36%). In agriculture the rates of poisoning due to direct exposure to pesticides ranged from 2.9% in the altiplano to 8.8% in the warm valleys and 7.7% in the plains.

Deafness in workers directly exposed to noise ranged from 24% to 35% in different productive sectors.

Health of Special Groups

The true health situation of the minority ethnic groups is unknown. Lack of access to health services has resulted in high case-fatality rates from cholera in some of these groups.

Diseases and Health Impairments

Vector-borne Diseases

These diseases are found in 75% of the national territory. Different diseases tend to affect different segments of the population, but there is broad overlap, especially in the inter-Andean valleys and the plains. The incidence of most vector-borne diseases has risen in recent years, undoubtedly influenced by such factors as migration—prompted by the economic crisis and the shutdown of mines—and the opening of new settlement areas.

Malaria has been on the rise in recent decades. Some 40% of the population resides in areas of transmission. Whereas during the 1960s about 2,000 cases were recorded annually, in 1980 alone there were nearly 17,000. Positive slides reached a peak of 25,367 in 1989, for an annual parasite incidence (API) of 10 per 1,000; the number of positive slides dropped to 19,686 in 1990 and 19,031 in 1991, but there was an upturn again in 1992 to 24,448 (API of 8.8 per 1,000).

The epidemiologic situation with regard to malaria has clearly deteriorated: major outbreaks occurred in vast areas that had previously been free of transmission. The proportion of *Plasmodium falciparum* cases rose steadily from 3.2% in 1990 to 5.8% in 1991 and

11.3% in 1992, and resistance of *P. falciparum* to available drugs has been reported. The district of Guayaramerín, with an API of 214.6 per 1,000, accounted for 49.2% of the *P. falciparum* malaria cases.

The department of Tarija had an API 3.3 times higher than the national average and produced 28% of all the reported cases, although no *P. falciparum* cases were observed there. In 1991 just 1% of the positive localities contributed 70% of the cases. In the department of La Paz the API in the malarious area was 0.5 per 1,000 in 1985, 3.2 per 1,000 in 1989, 8.2 per 1,000 in 1990, and 4.5 per 1,000 in 1992.

No reliable information is available on mortality from malaria. Since 1991 the positive localities have been ranked according to the seriousness of the problem in order to assist in the planning of interventions.

Chagas' disease is a major problem in Bolivia. Vector-borne transmission occurs in 63% of the national territory. It is estimated that 55% of the population is at risk and that approximately 1.2 million people are infected with *Trypanosoma cruzi*. Data from the Ministry of Welfare and Public Health indicate that the disease was responsible for 13% of all deaths in the population 15 to 74 years of age and for 29% of the deaths in men aged 25 to 44 in 1991.

A study conducted in 1990 revealed 40% positive serology in the disease's endemic area, with regional variations ranging from a low of 9% in the department of La Paz to a high of 45% in Chuquisaca. All age groups were affected, including children under 5 years. Of the individuals with positive serology, 26% had electrocardiographic alterations compatible with Chagas' disease.

Surveys of blood donors conducted in the department of Santa Cruz in 1982–1983 showed that 62% of the donors tested were positive for *T. cruzi*; in Chuquisaca a positivity rate of 39% was reported in 1988–1989.¹ Other studies have found seroprevalence rates of 56% to 70% in blood donors.

Baseline studies in 1992 yielded infestation indexes of 73% for the department of Tarija and 82% for Chuquisaca and triatomine infestation indexes of 40% in Cochabamba and 61% in Chuquisaca; in these two latter departments, 40% and 53%, respectively, of the population in the study areas had positive serology. In the town of Tupiza (Potosí Department) the infestation

¹Pan American Health Organization. Estado actual de las acciones para la eliminación de la transmisión vectorial e interrupción de la transmisión transfusional del *Trypanosoma cruzi*. Report from the Southern Cone Initiative (August 1991–December 1992), 1992.

index reached 82%, while it ranged between 19% in Modesto Omiste and 94% in Sud Chichas. The vector dispersion index averaged 75% to 80%, but reached 96% in Santa Cruz.

In studies conducted in the department of Santa Cruz in 1989, vector transmission was found to be responsible for 42% of the cases, congenital infection for 27%, and transmission by transfusion for 12% (with no information available on the rest).

Congenital Chagas' disease is a problem in at least some of the areas studied. In the department of Santa Cruz 18.5% of the neonates weighing 2,500 g or less whose mothers were serologically positive were found to be infected. A recent study² undertaken to compare diagnostic methods revealed that in one maternity service 10.6% of 820 newborns weighing 2,500 g or less were positive in histopathological studies of the placenta; 73% of these infants had signs or symptoms, mainly hepatosplenomegaly.

There are no national data on leishmaniasis, nor is there a structured control program, although some universities, institutes, and nongovernmental organizations are working in this area and have warned that the problem is widespread in the recently settled warm valleys of La Paz Department and the Chaparé region of Cochabamba Department. The first cases of visceral leishmaniasis were detected in 1993 in the valleys, according to the Bolivian Institute of High-Altitude Biology.

Transmission of jungle yellow fever persists in Bolivia. For the years 1985–1988 cases numbered 54, 30, 23, and 12, respectively, with an average case-fatality rate of 70%. There were 107 reported cases in 1989, 50 in 1990, 91 in 1991, and 22 in 1992, and the average case-fatality rate for those years was 73%. In 1989 and 1990 most of the reported cases occurred in the department of Cochabamba. In 1991 there was an epidemic in the department of Santa Cruz that produced 71 of the 91 cases reported that year. In 1992 the cases occurred in the departments of La Paz, Santa Cruz, and Cochabamba, and the case-fatality rate was 82%. A 1990 survey conducted in Santa Cruz and the tropical region of Cochabamba indicated that vaccination coverage against yellow fever was 82.7% in Colonias del Chaparé, Carrasco Tropical, and Ichilo; 72.4% in the town of Montero; and 58.9% in the city of Santa Cruz.

²Azogue E, Darras C. Chagas congénito: estudio comparativo de la eficacia y del costo de los métodos de diagnóstico—Santa Cruz. 1993 [submitted for publication].

After reinfesting the department of Santa Cruz in 1980, the *Aedes aegypti* vector continued to spread and is now found in the 68 known localities in Santa Cruz, Beni, and Tarija. In late 1987 and early 1988 there was a dengue outbreak in the department of Santa Cruz, and a serosurvey identified dengue type I infection in 20.5% of the 354,552 inhabitants; no deaths were recorded. Similar outbreaks were also reported in other parts of Santa Cruz. During that same time an outbreak in the town of Villa Montes, Gran Chaco Province (Tarija), affected 53.8% of the 7,271 inhabitants. Cases of dengue were again reported in Santa Cruz at the beginning of 1993, but no information was available as to serotype involved or the extent or gravity of the outbreak.

Varying numbers of plague cases were reported in the department of La Paz throughout the 1980s. In 1989 there were 11 cases and 2 deaths, and in 1990, 10 cases and 2 deaths. Exanthematous typhus has not been reported in the country since 1987.

The last outbreak of Bolivian hemorrhagic fever occurred in 1975 in the department of Beni. Flooding in 1982 greatly extended the range of the rodent *Callomys callosus*, the reservoir of the disease, and highway construction in 1990 contributed to its further dispersion. It is believed that floods in 1992 may have caused even broader displacement, and a field study has been initiated to determine whether this is so. In February 1993 a case was confirmed in Mamoré Province in the department of Beni.

Vaccine-preventable Diseases

Wild poliovirus was last isolated in 1986, but several cases of poliomyelitis were diagnosed on the basis of clinical criteria between 1987 and 1989. Cases of flaccid paralysis were notified at a rate of 0.8 per 100,000 population in 1989, 1.9 in 1990, 2.5 in 1991, and 1.9 in 1992; all reports were fully investigated.

The incidence rate of whooping cough was less than 5 per 100,000 population during the period 1990–1992. For diphtheria it was less than 1 per 100,000 during the last decade, the most recent outbreak having occurred in 1983.

In 1992 the incidence of measles reached its highest level in 10 years (63.6 per 100,000 population). In infants under 1 year the rate was 319.4 per 100,000 (the number of live births is unknown), while in children 1 to 4 years of age it was 163 per 100,000. The highest incidence was in the department of Santa Cruz, where the overall rate was 160.4 per 100,000 population and

the rate in children under the age of 1 year reached 935 per 100,000.

The incidence of neonatal tetanus ranged between 20 and 24 cases per 100,000 children under 1 year during the period 1990–1992.

Between 1989 and 1992, the following increases in vaccination coverage were achieved: for the third dose of oral poliovaccine, from 49.0% to 83.5%; for the third dose of DPT, from 39.0% to 77.3%; for measles vaccine, from 47.0% to 79.8%; and for BCG, from 49.0% to 85.8%. Whereas in 1989 there had been 43 districts with coverage under 50%, by 1992 the number had fallen to eight.

Cholera and Other Intestinal Infectious Diseases

The presence of cholera was first recognized in the latter part of August 1991 in the department of La Paz, and by the end of that year there had been 206 reported cases and 12 deaths. The cases were concentrated in Río Abajo, El Alto, and the city of La Paz, with no record of sizable outbreaks or spread to the interior. In the first week of 1992, an explosive outbreak occurred in the department of Cochabamba, in both the capital city and the interior. The epidemic then spread rapidly to isolated indigenous settlements in Santa Cruz and Tarija and eventually reached all the other departments except Beni and Pando. In 1992 the country recorded a total of 23,645 cases and 400 deaths for an incidence rate of 375 per 100,000 population and a case-fatality rate of 1.7%, with wide variations among regions. The ethnic minorities (Guaraní and Mataco Indians) were especially affected. Although the disease attacked all ages, the population between 15 and 59 years of age was at greatest risk. There was a clear predominance of cases among males in the country as a whole. In some departments, the risk in rural areas was as much as five to eight times greater than in urban areas, although heavy outbreaks also occurred on the outskirts of Cochabamba, Santa Cruz, and other cities.

As already noted, acute diarrheal diseases are the leading cause of death in young children. A total of 66,490 episodes of diarrhea were reported in 1991, and 152,407 in 1992.

Chronic Communicable Diseases

The incidence of pulmonary tuberculosis increased from 64 cases per 100,000 population in 1982 to 124 in 1992—a period that also saw a sizable expansion of

control activities within the health services network. Proportionally, the age group most affected was that of persons 20 to 44 years old, and the group at greatest risk consisted of persons aged 60 to 64. The problem was most critical in the departments of Santa Cruz, La Paz, and Cochabamba, in which some high-risk areas had incidence rates five to eight times higher than the national average. The proportion of patients cured increased from 44.5% in 1988 to 71.3% in 1992.

For tubercular meningitis the incidence was 7 per 100,000 population, but the high risk of infection, estimated at 3%, suggests that the disease is considerably underdiagnosed and underreported.

In 1988 mortality from all forms of tuberculosis was 7.3 per 100,000 population for the country as a whole. It ranged from 89.6 per 100,000 in the city of Cobija (six deaths in the age group 15–64 years) to 2 per 100,000 in Trinidad (one death in the age group 65 years and over). In children under the age of 5 years the national rate was 2.9 per 100,000, with large variations between areas: in the city of Potosí the level reached 30.9 per 100,000, but it was zero in five departments. The age group at greatest risk was that of persons 65 and over, among whom the rate was 39.7 per 100,000, with variations ranging from 429.7 in Tupiza to zero in Cobija. In cohort studies, the proportion of deaths ranged between 3% and 5% during the period 1988–1992. However, this problem could easily be overestimated (by counting “deaths associated with tuberculosis” rather than “deaths from tuberculosis”) or underestimated (by failing to count deaths in patients who were lost to follow-up because they abandoned treatment or moved away).

Little is known about the epidemiologic status of leprosy. The disease occurs throughout a wide geographical area that includes all the departments with the possible exception of Oruro and Potosí and the altiplano region of La Paz. In the affected departments the prevalence ranges from 0.4 to 99 cases per 100,000 population. There is no information on incidence.

Acute Respiratory Infections

These diseases constitute the second leading cause of deaths in infancy, 70% of which are deaths from pneumonia. In absolute numbers, 11,000 deaths in children under the age of 5 were attributed to this cause, according to the National Bureau of Personal Health Care. Pneumonias are overreported because of classification problems (i.e., the tendency to automatically regard any ARI as pneumonia), which are currently being addressed through extensive training pro-

grams. The National Population and Health Survey in 1989 found that episodes of ARI are most frequent in children under 2 years of age. According to this source, the incidence of ARI in children is twice as high in the plains as it is in the altiplano or the valleys.

Rabies, Foot-and-Mouth Disease, and Other Zoonoses

Rabies continues to be a problem in some regions, including the departments of Santa Cruz, Cochabamba, and La Paz. In the country as a whole there were 11 reported cases of human rabies in 1989, 8 in 1990, 11 in 1991, and 25 in 1992. In 1991 and 1992, 1,701 and 1,773 cases, respectively, were recorded in animals. Only 9,000 cats and dogs were vaccinated against rabies in 1989, but this figure rose sharply to 220,000 in 1990, 250,000 in 1991, and 310,000 in 1992. Most of these vaccinations (87%) were administered in the cities of La Paz, Santa Cruz, and Cochabamba.

Other zoonoses that are problems in Bolivia are cysticercosis and teniasis, fascioliasis, and foot-and-mouth disease.

AIDS and Other Sexually Transmitted Diseases

AIDS was first reported at the end of 1985. Ten cases were notified in 1988, 2 in 1989, 9 in 1990, 17 in 1991, and 8 in 1992. As of March 1993 the total number of persons known to be infected with HIV had risen to 96. Of the other sexually transmitted diseases, the most prevalent are gonorrhea and syphilis. Over the years 1989–1992 the rates for reported cases of gonorrhea were 24, 28, 36, and 30, respectively, per 100,000 population. During the same period, the rates of reported syphilis cases were 70, 66, 63, and 44 per 100,000. In 1990–1991 there was an outbreak of chancroid, which is uncommon in Bolivia, with 100 cases reported.

Nutritional and Metabolic Diseases and Deficiencies

According to information from the International Fund for Agricultural Development (1989), the per capita availability of calories experienced a slight decline between 1979–1981 and 1986–1988, from 2,082 to 1,987.

Malnutrition in children under 5 years of age ranged from 29.2% to 47.3% in the various departments, and there have been no significant changes in recent years. The census of height among schoolchildren, conducted by the National Epidemiological Surveillance System

(SVEN) in 1988–1990, found that 35% of the school population aged 6 to 9 showed retarded height growth to the extent that they fell below two standard deviations of the reference population distribution; in rural areas the proportion was 40%.

According to data from the National Population and Health Survey, 13% of the children under the age of 36 months who were examined were underweight for their age by at least two standard deviations of the reference population distribution, as established by the U.S. National Center for Health Statistics. The proportion was higher in rural areas (15.9%) than in urban areas (10.7%). The SVEN census, in turn, found that 11.7% of the infant population that had access to health services showed retarded weight gain for age.

In 1983 a survey on the prevalence of goiter revealed that 65.3% of the population was affected by iodine deficiency disorders. Another survey in 1989, using the same indicator, showed that the extent of the problem had decreased to 20%. Measurements of iodine levels in 1990 and 1991 were normal in urban areas, and in rural areas 95% of a series of samples taken from 222 communities had adequate levels. A 1991 study estimated that 9.1% of the population (539,639 inhabitants) was at high risk because iodized salt was only available 20% or less of the time. These people live in scattered communities in sparsely populated rural areas. Measurements of iodine levels in urine taken on 3,146 samples from schoolchildren and adults in 85 communities indicated that 65 of the localities had adequate levels of iodine. Similarly, analysis of 5,138 filter-paper blood samples from 170 high-risk communities showed iodine deficiency in only 26 of the localities (15%).

Studies of vitamin A deficiency have focused on children 12 to 71 months of age in the most depressed areas of the three ecological regions. The results, based on serum retinol levels, indicated that the problem was greatest in rural areas, especially in the altiplano, where the prevalence was 19.3%, and the plains, where the rate was 16.5%. However, almost half (48.3%) of the study population was found to suffer from marginal vitamin A deficiency. This problem is being addressed through the administration of 200,000-IU capsules during the EPI vaccination campaigns.

Malignant Neoplasms

There is no national tumor registry. The only data available are from the La Paz Cancer Registry, which was created in 1977 and is maintained intermittently, depending on the availability of funds. According to

these records, during the period 1980–1990 the incidence of cancer was twice as high in women (145.8 per 100,000) as in men (72.5 per 100,000). The most frequent sites in women were: uterine cervix (45.5 per 100,000), breast (21.2), gallbladder and bile ducts (13.9), and skin, not including melanoma (8.5). In men the common sites were: prostate (10.4 per 100,000), skin, not including melanoma (8.9), stomach (7.6), and gallbladder and bile ducts (7.0).

In 1988 the Ministry of Health launched a systematic program for the detection and control of cancer in women. During the first 2 years it focused on cancers of the uterine cervix and breast.

Accidents and Violence

The collection, analysis, and processing of data on accidents and violence has not been systematized. According to data from the Planning Department of the National Police, between 1988 and 1992 a total of 23,661 persons were hurt in traffic accidents, of whom 2,901 died and 20,760 suffered injuries of varying severity. According to the records of the Clinics Hospital in the city of La Paz, 24% of the 8,049 emergency cases attended in 1990 involved injuries from accidents. In hospitals in Cochabamba and Santa Cruz, injuries rank among the five leading causes for hospital treatment in both adults and children.

With regard to violence, data from the city of Santa Cruz are of interest in light of its rapid population growth rate (6.4% per year). Statistics from the Crime Bureau show the following breakdown: of the 597 charges filed in 1989, drunkenness accounted for 24%; kidnaping, 18%; rape, 18%; physical assault and injury, 11%; minor threats, 7%; and other charges, 22%.

The National Organization for the Care of Women, Children, and the Family, which was created to help establish and coordinate national policies for the protection of these population groups, includes among its activities a campaign against violence.

Oral Health

Some form of caries affects 97% of the population. In the city of El Alto, children 5 to 14 years of age who were attended in Ministry of Health clinics during 1992 had a DEF index (decayed, extracted, and filled teeth) of 11.2. A similar situation was found in the city of Riberalta among children who were attended in Ministry of Health establishments: for the group aged 3 to 5 the DEF index was 6.9; those aged 6 to 11 had a

DMF index (decayed, missing, and filled teeth) of 4.9; and those aged 15 to 18 had a DMF of 6.2. In the city of Tupiza, children between the ages of 6 and 11 years had a DMF index of only 1.6.

In 1989 direct prevention interventions were initiated, including programs to promote biweekly self-application of 0.2% sodium fluoride among the school population.

Work-related Diseases and Injuries

Health service coverage of the working population is estimated at no more than 10%. A high proportion of the economically active population (63.8%) is in the informal sector and therefore not covered for occupational risks.

Risk Factors

Risks in the Physical Environment

Drinking Water and Other Water Resources. Only four of the principal urban centers have installations for the treatment of wastewater, and consequently several of the major river basins continue to have high levels of pollution. An added concern is that this water is used to irrigate vegetable crops. Moreover, industries in general, and the mining industry in particular, fail to control the waste that they discharge into the country's watercourses, making for a high risk of chemical contamination, especially with heavy metals, in water that is often used for human consumption. In addition, the technique employed in panning for alluvial gold releases mercury in some rivers in the departments of Pando and Beni, and this pollution can potentially affect the health of humans who eat fish contaminated with mercury.

Air and the Atmosphere. Emissions of metallic particulates and gases severely pollute the air and atmosphere wherever mining and related activities are carried on, especially in the vicinity of foundries in the cities of Potosí, Oruro, and El Alto. In addition, the lead content of gasoline is very high, resulting in high levels of heavy-metal pollution in the urban environment.

Forests and Croplands. Extensive forested areas have been recklessly cleared for farming and livestock-raising in the warm valleys of La Paz Department and the Chaparé region of Cochabamba, leading to a serious ecological imbalance and the extinction of local

plant and animal species. The country lacks explicit laws against deforestation, which is taking place haphazardly as lumber resources are exploited. There is no control over the use of agricultural pesticides, which produce high levels of pollution in the soil and rivers and place field workers at great risk of poisoning.

Domestic and Industrial Waste. There is no large-scale industrial activity, and the types of industry (chemical and others) that generate hazardous wastes are not well developed. Not all the major cities have adequate disposal of domestic waste, which usually pollutes their water sources.

Chemicals in the Environment. Because of the intensive mining activity in the western part of the country, there is considerable pollution from chemical contaminants released into the air, creating the risk of various types of poisoning and long-term damage to health.

Food Contamination. There is no efficient surveillance or control of food production, handling, storage, or distribution.

Natural Disasters and Industrial Accidents

According to the National Civil Defense, between 1991 and March 1993 a total of 176,629 families (693,145 individuals) were affected by floods and landslides. Prior to these disasters, more than 200,000 families were affected by droughts in 1990.

The droughts triggered migration to tropical areas more favorable for farming, which in turn increased the population at risk for diseases such as malaria, tuberculosis, yellow fever, and leishmaniasis. Economic losses have been estimated at more than US\$ 70 million.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

In response to the economic situation, in November 1991 the Government adopted a social policy, within the framework of the national development strategy, which is aimed at improving the conditions and the quality of life of the population. The policy calls for investment in the development of human capital as a

means of improving the living conditions of the population and at the same time fostering growth through increased productivity of the labor force.

The aim of the Bolivian social strategy is to improve opportunities and living conditions for the groups that are most vulnerable because of poverty, with focus on development of the population engaged in traditional agriculture, the urban population working in the informal sector, and certain vulnerable groups, including indigenous peoples, children, young people, women, the elderly, and families in difficult situations.

Although specific policies have been defined, budgets for education, health, and other social sectors have not been increased in order to fulfill them. The current free market has encouraged a trend toward the privatization of services offered by these sectors, including the social security system.

The country has not legislated a population policy and does not have a high-level technical or political agency responsible for this area. However, within the Ministry of Planning and Coordination there is a Technical Unit on Population Policy and also a Social Policy Analysis Unit. The national development strategy drawn up by this Ministry in 1992 includes policy guidelines on the subject of population.

With regard to health policies and strategies, in 1989 the Ministry of Welfare and Public Health established the basis for implementation of its National Health Project, namely, priority care for women and children under the National Plan for Child Survival and Development and Maternal Health, decentralization through the development of local health systems, and social empowerment.

The regionalization process was initiated in 1958, and 11 regional health units were established. Subsequently, during the phase of democratic renewal (1983), health policies and strategies were aimed at spreading knowledge throughout the population, encouraging participation, and extending coverage through the Comprehensive Plan for Health Activities. Starting in 1987, emphasis has been placed on the development of health districts (local health systems), and since 1989 bilateral international cooperation has provided broad-scale support for the health sector through the Ministry, nongovernmental organizations, and churches.

The national health policy calls for strengthening the Ministry as the head of the sector and bringing the sector together into an integrated but decentralized national health system. The Ministry is also responsible for delivering health care to the population. It is structured into 12 health units that oversee 88 health dis-

districts, which in turn contain health areas and peripheral health centers. In all, the Ministry provides care for 38% of the population through a three-tier model: national (tier I), regional (tier II), and district (tier III).

The Social Emergency Fund was established for the purpose of generating jobs to alleviate the effects of the structural adjustment, and it has undertaken a series of projects in the social sector. In 1991 it became the Social Investment Fund and was given the mandate of financing social projects, especially in the areas of education and health, and providing structural and organizational support at the district level.

In 1989 the Ministry initiated the process of defining its policies in the area of human resources development. The placement of trained professional personnel is not guaranteed, and imbalances exist in the supply of different types of professionals, since there is an overproduction of physicians at the expense of the other professional groups (nutritionists, nurses, social workers, etc.). There are no figures on the proportion of the health work force that is currently unemployed, but the health labor market is showing early signs of professional unemployment. Nevertheless, the surplus does not translate into high rates of coverage, since the last census reported that just 67% of the total population was covered by the formal health services; in rural areas the proportion was only 52%.

Training for community health workers, medical technicians, and health auxiliaries, as well as continuing education for health personnel in general, is the responsibility of the Ministry of Health and is closely tailored to the personnel needs of that institution.

In 1989, 3.41% of the national budget was allocated for health; in 1993 the total proportion was 4.51%, with 2.51% for public health services. This equates to an annual per capita expenditure on health of US\$ 16, while the budgetary allocation for social security amounts to an annual per capita expenditure of US\$ 41.

External cooperation plays an important role in the financing of this sector. More than US\$ 100 million has been committed by international donors for investment in health. Between 1991 and the first half of 1993, almost US\$ 14 million of this amount had been disbursed for 411 health projects. In addition, support is received from more than 400 nongovernmental organizations and churches that carry on activities in the area of health.

Nutrition programs involve two other government sectors: education (incorporation of courses on food and nutrition in the teacher training curriculum), and agriculture (specific projects, including food safety and improved production as part of the Comprehensive

Nutrition Project in support of the National Food and Nutrition Plan for the south of Bolivia). A number of efforts have been undertaken to respond to the malnutrition indices, with emphasis on immediate responses such as food aid, which is increasing at an annual rate of 22%.

In 1989 the Ministry established the National Campaign against Goiter and assigned high priority to this public health program.

Food aid is channeled through preschool and school feeding programs, maternal and child care agencies (women's organizations, public day-care centers, comprehensive child development programs), institutional food programs, humanitarian aid, food-for-work swaps, emergency aid, and specific projects through a funding system that allows for the inclusion of national products.

In the Anti-Poverty Campaign, launched by a supreme decree in 1991, basic sanitation was declared a national priority, along with education, health, and productive infrastructure. As part of the country's social policy, the program "Water for All by the Year 2000" was inaugurated in 1992 with a view to improving the population's quality of life through the provision, upgrading, and maintenance of drinking water and sanitation. This program will require an investment of US\$ 15,000 million, and part of the funding has already been guaranteed, as well as support from regional development corporations, private water and sanitation enterprises, and local governments.

Starting in 1991, Bolivia adopted a policy aimed at streamlining the work of all the components, in both the public and private sector, involved in supplying medications. The goal of the policy is to improve the availability of pharmaceutical products needed for timely and comprehensive care, with special emphasis on improving access in high-risk groups and ensuring that medications are affordable for the disadvantaged sectors of society.

The Ministry of Health is responsible for promoting the rational use of drugs and has initiated the development of a national program on essential drugs.

In 1991 decrees were issued creating the National Science and Technology System, under the Vice Presidency of the Republic, and the National Council for Scientific and Technological Research in Health, under the Ministry of Health.

In November of that same year, the basic principles of the social policy were established by supreme decree. The National Social Policy Council was created to implement the Anti-Poverty Campaign, and social development councils were created at the department and

provincial levels. The health authorities at each of these levels serve as members of the councils. Social consensus has been adopted as the political strategy, and inter- and intrasectoral cooperation, together with community participation, are the operational strategies.

The Health Code approved in 1978 continues to be in effect. This law gives the Ministry of Health responsibility for defining national health policy and planning, controlling, coordinating, and setting standards for health activities throughout the country in all public and private institutions, without exception. Within the framework of the Health Code, the Government has formulated the National Plan for Child Survival and Development and Maternal Health, as well as legal instruments that facilitate its execution through an established organizational structure.

Organization of Services

Personal Health Care Services

The population makes use of three types of health services: formal (based on the scientific medical approach), traditional (rooted in culturally determined views on health), and informal (essentially, strategies for survival). It is estimated that 25% to 30% of the people treat themselves with over-the-counter or home remedies. Approximately 10% to 15% rely on traditional medicine, which takes different forms depending on the cultural context. This figure may be an underestimation because of reluctance among survey participants to admit their preference for this type of service. In urban areas recourse to traditional medicine is 5% or less, whereas in rural areas the figure is about 25%. Finally, formal services account for 55% to 65% of the demand.

In June 1990 the National Institute of Statistics undertook a comprehensive household survey of 30,350 persons living in 6,437 homes in the nine departmental capitals and the city of El Alto. Of this sample population, 18% were ill or suffering from an accident at the time of the survey, and of these, 48.1% had sought some kind of formal care (38% from Ministry services, 26% from the social security system, 30% from private practitioners, 6% from nongovernmental organizations), 32.9% had sought informal remedies, and 19% had done nothing.

The formal services comprise three broad systems: the Ministry of Health, social security, and private medical practice. According to figures available for 1991, the social security system covers 24% of the national population; 85% of this coverage is provided by

the National Health Fund, in which the State is the principal employer, and the rest by 12 autonomous comprehensive health insurance funds, with an average beneficiary population of 19,100. Dependents represent 15% of the population covered. The social security system has a much greater presence in the highland departments where mining is a traditional occupation than elsewhere in the country. It also tends to concentrate its services in urban areas, with only sparse coverage in rural areas.

For the most part, the services of the Ministry of Health are directed toward the rural and urban peripheral population. The Ministry has a relatively extensive network of establishments, which is more developed in rural than in urban areas. It has not been able to keep pace with the rapid growth of the large metropolitan centers—La Paz, Cochabamba, and Santa Cruz in particular.

The private sector has grown considerably in the cities, adapting to the socioeconomic conditions in the neighborhoods where its services are located. Private medical practice has failed to become involved in the planning and organization of the health system, and little control is exercised over the private sector.

More than 400 nongovernmental organizations (NGOs) carry out activities in the health sector, although only 42 of them have formal agreements with the Ministry. Their relationship to the Ministry ranges from almost full integration to total autonomy. They are unevenly distributed around the country: while there are extensive areas that receive no support, in other places the NGO services overlap. The NGO services tend to be concentrated in the more developed departments along the central La Paz-Cochabamba-Santa Cruz axis, although there are also some rural services. Less than 5% of the people report that they use the services of these organizations, perhaps because they do not fully recognize them as part of the formal sector, or possibly because the real impact of the NGOs is not in keeping with their outlay of resources.

In 1991 the Ministry of Health provided 1,678,495 outpatient consultations, and the social security system, 2,659,956. The figures for 1992 were 2,187,975 and 2,504,035, respectively. In 1992 the ratio of medical consultation per inhabitant-year was 0.45 for the Ministry and 1.76 for the social security system, for a combined ratio of 0.76.

The rates of hospitalization were 34.2 per 1,000 for the Ministry and 53.0 per 1,000 for the social security system, representing, respectively, 6% and 3% of all consultations. The hospital fatality rate is similar for the two sectors: about 2.7% of all discharges. The average hospital stay is 5.1 days in the Ministry facilities

and 7.4 days in those under the social security system, and the respective bed occupancy rates are 42% and 52%. The use of support services is similar for the two sectors: 0.41 and 0.46 laboratory tests per consultation and 0.21 and 0.23 surgical interventions per hospital discharge for the Ministry and the social security system, respectively.

Dental services are not very well developed, as indicated by the consultation rates: 0.04 per person per year in the Ministry's services and 0.25 in those of the social security system, for a combined rate of 0.09.

No separate records are kept on psychiatric care.

Coverage of prenatal care given by trained personnel is 61%, and delivery care provided by specialized personnel is 21%. Activities under the 1989–1993 Plan for Child Survival and Development and Maternal Health will continue after 1993 under the Ten-Year Plan of Action for Children and Women, which has strategies and goals consistent with regional and global plans.

Care for the disabled is the responsibility of the National Rehabilitation Department, with the Ministry of Health as the directing, normative, and supervisory agency at the national level. The Ministry of Health, through its health units, provides some partial services for persons with physical disabilities at the Clinics Hospital in La Paz, the Viedma Hospital in Cochabamba, and the Japanese Hospital in Santa Cruz. Each of these institutions has a physician specialized in physical medicine and rehabilitation as well as a staff of physical therapists. The blind receive support from the National Blindness Institute, which operates four schools at the national level. There are no rehabilitation services for persons with hearing impairments. Coordination with other ministries or agencies takes place on a direct basis and such efforts are limited.

Services for mentally handicapped children are provided in the city of La Paz through the Child Adaptation Institute and in the city of Sucre by the Psychopedagogical Institute. The Bolivian Confederation of Persons with Disabilities is the unifying force at the national level for 66 agencies, societies, and associations concerned with the disabled. The primary care approach to rehabilitation has been adopted progressively since 1991. This approach is an established part of the Community-based Rehabilitation Program.

Environmental Services

In November 1991 the Ministry of Urban Affairs assumed the direction of environmental services through its National Bureau for Basic Sanitation. Also

involved in the provision of these services are the Ministry of Health, the regional development corporations, local governments, and the private sector.

Of the US\$ 701 million budgeted for investments in 1981–1990, only US\$ 189 million was actually invested in this sector. During 1989–1992 external contributions accounted for 84.3% of the investments made. Even though the negotiation of soft credit (long terms and low interest rates) made it possible to implement projects and master plans that improved the coverage of these services, the increase in demand far outstripped capacity.

Only four of the country's major cities have installations for the treatment of wastewater. According to the 1992 census, 84% of urban households have access to water (though not necessarily potable water), but in rural areas this figure was only 24%.

Social and Community Participation

Intersectoral efforts in the area of social participation were undertaken in cooperation with the Ministry of Defense through the national armed forces. Under the Comprehensive Plan for the Training of "Health Sentinel" Soldiers, 750 military instructors were trained and a total of 8,000 soldiers were subsequently reached. The program has now been institutionalized in the three branches of the armed forces. In this way, health promotion and disease prevention have become integral parts of the military curriculum. The plan is to train more than 40,000 soldiers per year.

The "Women, Education, and Life" program is an example of intersectoral cooperation with the Ministry of Education. Under this program, more than 700 community diagnostics of the situation of women have been developed, with the assistance of women leaders and rural teachers.

Available Resources

The public health service work force numbered 20,446 in 1991, of whom 11,893 were professionals, technicians, and health auxiliaries and 8,553 were administrative and service staff. The Ministry of Health employed 1,948 physicians and 4,106 nursing personnel, while the social security system had 1,580 physicians and 2,476 nursing personnel.

Almost all the hospitals have laboratories. The Ministry of Health, through the National Laboratory Department of the National Service Bureau, maintains a national registry of laboratories installed in the coun-

try's health units. The laboratories are distributed by department as follows: Beni, 34 (including 26 in Riberalta); Chuquisaca, 25; Cochabamba, 29; La Paz, 65 (including 5 in El Alto and 60 in the city of La Paz); Oruro, 13; Pando, 1; Potosí, 8 (including 2 in Tupiza); Santa Cruz, 42; and Tarija, 4.

There are several national and regional reference laboratories, including the National Health Laboratory Institute in La Paz, the National Tropical Disease Center in Santa Cruz, the University Center for Tropical Diseases in Cochabamba, and the Bolivian Institute of High-Altitude Biology in La Paz. The first of these is directly under the Ministry of Health while the others operate with funding from foreign governments, universities, and the Ministry.

Of the 25,000 units of blood transfused annually in Bolivia, only 15% to 20% are screened serologically for Chagas' disease, syphilis, hepatitis B, and HIV.

According to the Comprehensive Household Survey conducted in 1990, the largest health expenditure was for the purchase of drugs, which consumed 46.2% to 75.3% of total expenditures on health.

In 1990 the Ministry of Health established the Drug Supply Clearinghouse (CEASS), a decentralized autonomous enterprise with its own legal identity, which is responsible for managing the drugs that fall under the National Essential Drugs Program as well as special public-sector programs and also collaborates with nonprofit organizations and the social security system. CEASS has established a network of regional supply units in several of the country's departments.

Vaccines and biological products are purchased mostly with external cooperation funding. However, in recent years the share borne by the national budget has increased, totaling the equivalent of US\$ 75,000 in 1991 and US\$ 151,000 in 1992.

BRAZIL

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

A new constitution was enacted in 1988 which, for the first time in the history of Brazil, gave special consideration to health. That year also marked the first time in 30 years that the country's president was elected by direct vote. Following the election, sweeping administrative reforms were introduced, which resulted in a reduction in State participation in the management of the economy, privatization of a large number of government-run companies, and a major downsizing of the bureaucratic and administrative structure. In 1992 the elected president was forced to resign in the face of widespread public pressure, which led to new political and administrative changes. Despite efforts to stimulate the economy, little positive growth was registered. The country's estimated external debt stands at US\$ 130,000 million. Inflation, which reached 80% per month in 1990, declined during a brief period but subsequently leveled off and has remained at between 25% and 30%, frustrating attempts to stabilize the economy.

Failure to exercise tighter control over public finances, persistent high inflation, and political instability, among other factors, have thwarted the expected recovery of economic growth. The gross domestic product (GDP), after increasing 3.3% from 1988 to 1989, fell 4.4% in 1990 and grew a scant 0.9% in 1991. The change in per capita GDP in those same years was 1.3%, -6.2%, and -1.0%, respectively. On the political front—where conditions reflect problems that have accumulated over the past two decades—the country faces a number of difficult challenges. One is the rapid process of decline, illustrated by the fact that industrial production in 1992 was lower than in 1980, while the population had increased by 30%. Another is the State's severe loss of managerial capacity, which has affected activities such as tax collection and verification of the amounts received, and this in turn has had a major impact on the State's ability to meet its obligations.

The economic situation, which mirrors the uncertain political situation, is characterized by high and persistent inflation, an enormous public deficit, profound recession and disorganization of the bases of production, unresolved structural issues (fiscal reform, State reform, agrarian reform), and large outlays of capital to pay off the external debt.

The political and economic situations, in turn, are reflected in the social situation. Unemployment rates have remained high, at between 12% and 14% of the economically active population (EAP). According to data for the São Paulo metropolitan area, in July 1992 the mean monthly income of salaried workers and wage earners was 51.8% and 54%, respectively, of what it had been in 1985. As for the supply of social goods and services, despite the difficulties brought on by the financing crisis, the lack of administrative continuity, and the disorganization of the State apparatus, it has been possible to maintain at least the same mean levels of current spending as in the last decade. Very little was invested in low-cost housing and basic sanitation during the period 1989–1991, and the average availability of housing during that period fell to 224,000 units, down from 550,000 in 1980–1982.

Between 1989 and 1991 disparities in the distribution of income became more pronounced. According to the Brazilian Statistics and Geography Institute Foundation, the wealthiest 10% of the population had a 48.7% share of national income (52.5% in the Northeast region) while the poorest 10% received only 0.8%. The poor are estimated to number 65 million (close to 45% of the population), almost half of whom (32 million) are indigent. In 1990, 30% of the employed population over 10 years of age had a monthly income equivalent to no more than one minimum wage (between US\$ 60 and US\$ 100); in rural areas the proportion was almost 50%.

In 1990 the EAP totaled 64.4 million persons, 64% of whom were male and only half of whom were contributing to the social security system. (In Brazil, the EAP includes persons over the age of 10.) More than 10% of the EAP—i.e., more than 7 million persons—was under 18 years of age. By area of activity, 22.8% of workers were employed in agriculture, 22.3% in industry, and 54.9% in the service sector. Of the 40.1 million

wage earners over the age of 10, only 59% had formalized their status by obtaining a signed work card (in the Northeast the proportion was 41%). Female participation in the work force in urban areas increased from 33.6% in 1981 to 40.1% in 1990. Of the total EAP, 64.7% were wage earners, 22.7% were self-employed, and 4.6% were employers (the rest received no remuneration). The unemployment rate recorded in some metropolitan areas showed monthly variations of between 3.3% and 5.3% in 1990 and between 3.8% and 5.9% in 1991.

In 1990, 19.6% of the population aged 7 years or older was illiterate. The illiterate population was unevenly distributed, with 13.5% in urban areas and 37.8% in rural areas. The distribution by region was also uneven, ranging from 8.7% to 27.8% in urban areas of the South and the Northeast regions, respectively (the proportions for rural areas were 15.9% and 55.8%).

Population

According to the 1991 census, the Brazilian population numbered 146,154,502. The average annual growth rate between 1980 and 1991 was 1.9%, which represented a marked decline from the rates of 2.5% and 2.9% registered during the 1970s and the 1960s, respectively. The urban population increased to 110,875,826 (75% of the total population). The rural population declined during the 1980s as it had during the 1970s, when a decrease in absolute numbers was observed for the first time.

The country's nine major metropolitan areas grew at a much slower rate in the 1980s than in the 1970s. This was particularly true of São Paulo, which registered a net loss of population. As the pace of growth has slowed in the major cities, it has picked up in the country's medium-size cities. The concentration of population by political-administrative region was 42.5% in the Southeast, 29.0% in the Northeast, 15.1% in the South, 6.9% in the North, and 6.4% in the Central-West region. In 1991 the country had 72,171,165 males and 73,983,337 females, which is a male-female ratio of 97.6:100. The proportion of males is greater in the diamond-mining regions of Roraima and Sul do Pará, whereas there is a marked predominance of women in the areas of emigration to the Northeast and in the regional commercial centers that receive short-distance migration—i.e., the capitals of the Northeast.

Although data on the age structure of the population in 1991 are not available, it is assumed that the base of the population pyramid has continued to shrink. In 1960, 43.0% of the population was between 0 and 14 years of age, and 4.7% was 60 or older; in 1980 these proportions were 38.0% and 6.1%, respectively.

The total fertility rate in Brazil decreased from 5.8 during the 1960s to 4.3 in the period 1975–1980. In 1984 a national household survey found a total fertility rate of 3.5. The results of the 1991 census indicate that the total population is growing at a slower rate than in the 1980s. The decline in fertility had already begun among some segments of the urban population in the 1950s and 1960s, and this trend has subsequently extended to all regions, to rural areas, and to groups with

TABLE 1
Proportional mortality (%) by age (in years) and groups of causes, Brazil, 1989.

| Groups of causes | Under 1 | 1–4 | 5–19 | 20–49 | 50 and over | Total |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------|
| Signs, symptoms and ill-defined conditions | 20.0 | 29.5 | 10.7 | 12.6 | 19.9 | 18.3 |
| Defined causes | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Diseases of the circulatory system | 0.7 | 2.8 | 5.4 | 15.3 | 50.3 ^a | 34.3 |
| External causes | 1.3 | 19.3 | 61.7 ^a | 40.5 ^a | 4.7 | 15.3 |
| Malignant neoplasms | 0.2 | 5.3 | 6.8 | 9.5 | 16.4 | 12.0 |
| Diseases of the respiratory system | 13.4 | 23.9 | 5.9 | 5.4 | 10.7 | 9.9 |
| Infectious and parasitic diseases | 19.5 | 24.7 ^a | 6.2 | 5.6 | 3.8 | 6.7 |
| Certain conditions originating in the perinatal period | 49.0 ^a | 0.2 | — | — | — | 6.2 |
| Other causes | 15.9 | 23.8 | 14.0 | 23.7 | 14.1 | 15.5 |

^aLeading cause of death in the age group.

Source: National Health Foundation and National Epidemiology Center.

TABLE 2
Proportional mortality (%) by groups of causes, for the country as a whole and the administrative regions, Brazil, 1986 and 1989.

| Groups of causes | Brazil | | Regions (1989 ^a) | | | | |
|--|-----------------------|-------------------|------------------------------|-----------|-----------|----------|--------------|
| | 1986 | 1989 ^a | North | Northeast | Southeast | South | Central-West |
| Signs, symptoms, and ill-defined conditions | 20.3 | 18.3 | 26.1 | 42.1 | 9.1 | 12.5 | 14.3 |
| Defined causes | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Diseases of the circulatory system | 33.3 (1) ^b | 34.3 (1) | 23.2 (1) | 29.3 (1) | 36.2 (1) | 37.2 (1) | 29.8 (1) |
| External causes | 14.7 (2) | 15.3 (2) | 20.0 (2) | 16.5 (2) | 18.1 (2) | 13.8 (3) | 22.0 (2) |
| Malignant neoplasms | 11.4 (3) | 12.0 (3) | 9.6 (5) | 9.1 (4) | 12.1 (3) | 16.1 (2) | 10.7 (3) |
| Diseases of the respiratory system | 10.3 (4) | 9.9 (4) | 7.9 (6) | 7.9 (6) | 10.6 (4) | 10.6 (4) | 7.9 (5) |
| Infectious and parasitic diseases | 7.8 (5) | 6.7 (5) | 14.3 (3) | 12.2 (3) | 5.1 (6) | 4.4 (6) | 9.3 (4) |
| Certain conditions originating in the perinatal period | 7.1 (6) | 6.2 (6) | 10.7 (4) | 8.2 (5) | 5.6 (4) | 4.8 (5) | 6.6 (5) |
| Other causes | 15.4 | 15.5 | 15.5 | 16.8 | 12.3 | 13.1 | 13.7 |

^aPreliminary data.

^bNumber in parentheses indicates the ranking among the six leading causes of death.

Source: National Health Foundation and National Epidemiology Center.

lower income and less education. There continue to be significant differences in fertility, with rates remaining relatively high among the poor rural population of the North and Northeast.

Mortality

Mortality data for 1989 are shown in Tables 1 and 2. Although the information has not been analyzed according to living conditions, the breakdown by major political-administrative units reveals that mortality rates differ in the population as a result of the unfair distribution of national wealth (Table 2).

Diseases of the circulatory system were the leading cause of death in all regions, although the proportion of deaths from this cause varied, ranging from 23.2% in the North and 29.3% in the Northeast (the poorest regions) to 36.2% in the Southeast and 37.2% in the South (the regions with the wealthiest population). The proportion of deaths attributed to signs, symptoms, and ill-defined conditions also varied, from 9.1% in the Southeast to 42.1% in the Northeast, indicating a lack of health care in the Northeast, as well as possible mistakes in analysis of the data.

Similarly, the presence of infectious and parasitic diseases among the six leading causes of death is an indicator of poor living conditions. In the North and

Northeast, these diseases rank third among the causes of reported deaths.

One-third of the deaths from diseases of the circulatory system were due to cerebrovascular disease, while ischemic heart disease was responsible for 29%. External causes and malignant neoplasms were the second and third leading causes of death, respectively. Among the external causes, traffic accidents and homicide are particularly noteworthy, owing to their growing importance. Each of these two causes is responsible for more years of potential life lost (YPLL) than any other cause except malignant neoplasms. In 1989 the YPLL from these causes totaled 1,271,861 and 1,453,529, respectively, which is on the order of 45.4 and 48.6 YPLL/death, respectively.

All the regions have seen a decline in premature deaths coupled with a rise in mortality among the older population groups, although there continue to be disparities between regions in proportional mortality by age. In the North region, for example, more than one-fourth of all deaths continue to occur in the under-5-years age group.

The leading causes of death for the various age groups were as follows: conditions originating in the perinatal period for infants aged under 1 year of age, infectious and parasitic diseases for children aged 1-4, external causes for persons aged 5-49, and diseases of the circulatory system for persons 50 years and over.

Morbidity

Little information is available on the distribution and characteristics of morbidity in Brazil. Data on hospitalization are available through the disease reporting system that is part of the national epidemiologic surveillance system, as well as through the hospitalization register maintained by the National Health Care Institute of the social security system, which records 90% of hospitalizations at the national level.

The data in the hospitalization register for 1984–1991 indicate that diseases of the respiratory system (ICD-9, 466, 480–519) were the leading cause of hospitalization, accounting for almost 15% of the total. The other leading causes, in descending order, were normal delivery (650), accounting for 10% of hospitalizations, and mental disorders (290–319), direct obstetric causes (640–646, 651–676), and diseases of the digestive system (530–579), each of which was responsible for about 7% of all hospitalizations. The category “signs, symptoms, and ill-defined conditions” (780–789) figured among the top 20 reasons for hospital stays. Cardiovascular diseases (415–429, 401–405, 430–438), which together constitute the leading cause of death, are also an important cause of hospitalization. Hypertension is responsible for one-fourth of the hospitalizations from this group of causes.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

Infant mortality fell steadily at an average rate of 2.7% per year during the 1980s. The decline was faster in urban areas than in rural areas, owing to technological advances in the control of diarrheal diseases and acute respiratory infections, promotion of breast-feeding, and control of vaccine-preventable diseases in urban areas. Infant mortality continues to be high in impoverished parts of the country. In 1979 the national rate was 85 per 1,000 live births, and the estimate for 1991 was 55 per 1,000, but marked regional differences exist. In the Southeast, for example, the infant death rate in 1989 was 35 per 1,000 live births, while in the Northeast it was 92 per 1,000. Neonatal mortality remained stable during the period 1982–1988 at approximately 25 deaths per 1,000 live births.

In 1988 conditions originating in the perinatal period were the leading cause of infant death, accounting

for 47.1% of the total. Intestinal infectious diseases caused 16.4% of infant deaths, pneumonia 11.4%, congenital anomalies 7.8%, and nutritional deficiencies 4.6%.

Despite a downward trend in the rates of intestinal infectious diseases, they continue to be the leading cause of morbidity and mortality among children under 5 years old. In the 1–4 age group, 24.7% of all deaths in 1988 were due to infectious and parasitic diseases, the predominant ones being diarrheal diseases. In 1989 the prevalence of diarrhea, as measured by the National Health and Nutrition Survey, was 10.5% at the time of the survey. Diarrheal diseases are an important factor in many cases of malnutrition and are responsible for approximately 30% of total demand for outpatient and inpatient hospital services.

Acute respiratory infections rank first as a cause of death in children 1–4 years old, accounting for 24.5% of total deaths. Nationally, the proportion of deaths due to intestinal infectious diseases decreased from 16.7% in 1979 to 11.1% in 1988, but marked differences were evident between regions (the proportion fell from 29.5% to 19.6% in the Northeast, and from 7.6% to 5.2% in the Southeast). The proportion of deaths caused by vaccine-preventable diseases also diminished, from 12.9% in 1979 to 2.4% in 1988 (from 10.6% to 6.0% in the Northeast, and from 14.2% to 0.3% in the Southeast). The proportion due to external causes, however, rose: it almost doubled between 1979 and 1988 in the Southeast (from 10.9% to 19.9%) and in the country as a whole (from 9.4% to 18.3%), while in the Northeast the percentage of deaths from this group of causes actually diminished (from 6.6% to 3.0%). The higher proportional mortality from diarrheal diseases in the North and Northeast regions of the country is indicative of unfavorable socioeconomic conditions in those areas, such as deficient environmental sanitation, lack of access to health services, and very low educational levels, especially among mothers.

Mortality from diarrhea, acute respiratory infections, and malnutrition is three times higher among children whose mothers have no formal education. In addition, the risk of dying from acute respiratory infections is three to five times higher among children who are fed exclusively with breast-milk substitutes. In 1990 it was estimated that only 4% of infants aged 0–3 months were being exclusively breast-fed, and 28% of infants still being breast-fed at 6–9 months were receiving some type of supplementary food along with breast milk.

The incidence of low birth weight (under 2,500 g) is approximately 10% among registered births. The intro-

duction of the National System for the Registry of Live Births has made it possible to confirm the estimates.

Adolescent Health

External causes are responsible for the largest proportion of adolescent mortality. In 1989, 54.9% of male deaths in the 10–14 age group were due to this group of causes, and in the 15–19 age group the proportion rose to 73.9%. Among females, the proportions were 35.6% and 39.4% for the same age groups. Traffic accidents were the leading external cause, except in the group comprising males aged 15–19, among whom homicide was the most important (38.6%).

Studies of drug use carried out in 1989 in 17 cities revealed that 17.3% of first- and second-year students in public and private secondary schools used inhalants (solvents), 7.2% used minor tranquilizers, 3.9% used amphetamines, and 0.7% used marijuana. Among street children, of which the country has some 7 million, studies conducted in three capital cities indicated that 21.5% to 43.5% of those interviewed used inhalants, about 25% used marijuana, 1.0% to 4.5% used cocaine, 25.0% to 54.5% drank alcoholic beverages, and 44.0% to 75.0% smoked.

The percentage of teenage pregnancies is high. Studies between 1989 and 1990 in three capital cities showed that around 20% (21.4% in Rio de Janeiro) of adolescent women aged 15–19 had been pregnant at least once.

Health of Women

Care related to the reproductive process accounts for a large proportion of all health services provided to women aged 14–49. Estimates by the National Maternal and Child Health Agency (COSMI) for 1991 reveal sizable regional differences in prenatal care coverage, which ranges from 12.1% in Piauí to 80% in São Paulo. Of those women who do receive prenatal care, 30% begin late in pregnancy. In 1989, only 61.9% of pregnant women in the country received some type of prenatal care. Among women in the population group earning the equivalent of at least twice the minimum wage the proportion was 90%, but among those in the group earning the equivalent of half the minimum wage the figure was 44.8%. In the rural areas of the Northeast, 80% of poor women received no prenatal care.

According to data from the Unified Health System, in 1990 there were 314,911 hospitalizations for abor-

tion. COSMI estimates that abortions in that year totaled 1,100,000, or 1 out of every 3 pregnancies. A survey conducted by the Brazilian Geography and Statistics Institute Foundation in 1989 indicated that 82.9% of children under 4 years of age had been born in a hospital, and 31.8% of those births were by cesarean section. In the Northeast, 31% of children were born at home and 23% of hospitals births were by cesarean section (in the Southeast the proportion of cesareans was 47.2%).

According to Ministry of Health data for 1987, maternal mortality is 7.2 per 10,000 live births, with underregistration estimated at 50%.

Malignant neoplasms, taken as a group, make up the third leading cause of death among women. According to the Ministry of Health, programs to prevent gynecologic cancers reach only 10% of the female population. Cancer of the uterus and breast are the most frequent types.

Contraceptive methods are widely used; 43% of women of childbearing age and 71% of those living with a male partner use some method (tubal ligation is the method chosen by 44.4%).

Although accurate quantitative data are not available on domestic violence, the problem is receiving increasing attention from authorities and has prompted the development of mechanisms to protect the rights of women.

Health of the Elderly

The elderly population in Brazil is growing rapidly. It is estimated that by the year 2000 the group aged 60 years and over will number 14 million (almost 10% of the total population). Exact figures are not available on the incidence and prevalence of diseases in this group. One multi-center study carried out between 1986 and 1988 found the prevalence of diabetes mellitus to be 17.4% among those aged 60–69. Studies on the prevalence of hypertension in 1988 indicated that the rates are high and increase with age, reaching 63% in the group aged 60 and over. Respiratory diseases, arthropathies, mental disorders, malignant neoplasms, and blindness are also frequent among the elderly. In 1989 the leading causes of death in the population aged 50 and over, excluding deaths attributed to signs, symptoms, and ill-defined conditions (19.9%), were diseases of the circulatory system (50.3%), malignant neoplasms (16.4%), and diseases of the respiratory system (10.7%).

Health of Indigenous Peoples

The indigenous population, which today numbers only 300,000, has fallen prey to violence and to diseases which its communities lack the knowledge to combat. The health status of indigenous peoples is a direct reflection of how well their traditional territories have been demarcated and preserved. Malnutrition—a result of the dismantling of traditional food production systems and other means of survival—is twice as common among indigenous peoples as among low-income nonindigenous groups. The formulation of policy on indigenous health is the responsibility of the Ministry of Health. The first steps in this regard were taken in 1993, when a local health system was established in the Yanomami area, where onchocerciasis is present.

Diseases and Health Impairments

Mortality from vaccine-preventable diseases declined during the period 1987–1991. The last reported cases of *poliomyelitis* occurred in 1989. Since then, epidemiologic surveillance of suspected cases has been intensified with a view toward eliminating circulation of wild poliovirus. National vaccination days, held periodically, ensure high immunization coverage rates (close to 100%).

In April 1992 a national campaign was conducted to vaccinate children between 9 months and 15 years of age against *measles*. In 6 weeks 48 million children were vaccinated and a coverage level of over 95% was attained. Preliminary evaluations indicate that measles cases have decreased significantly: the number of reported cases fell from 42,352 in 1991 to 7,148 in 1992. This achievement was also due to an increase in routine vaccination at the local level.

The incidence of *whooping cough*, *diphtheria*, and *neonatal tetanus* decreased between 1980 and 1991. For whooping cough, the incidence fell from 38.4 per 100,000 population in 1980 to 4.9 per 100,000 in 1991; the incidence of diphtheria declined from 3.9 to 0.3 per 100,000 population and that of neonatal tetanus from 0.2 to 0.07 per 100,000 population. Among the vaccine-preventable diseases, neonatal tetanus was the leading cause of infant death in 1991, accounting for 261 cases and 197 deaths. The second leading cause was measles, which was responsible for 105 deaths. The distribution of these deaths, and likewise the completeness of reporting, varies greatly among the regions of the country, which reflects the disparities in living conditions.

In 1992 routine vaccination coverage for DPT (3 doses), BCG, and measles vaccine among children under 1 year was 53.3%, 79.7%, and 73.6%, respectively. Among the group aged 0–4 years, the 1991 coverage levels were 84.4%, 92.2%, and 100%, respectively. In the North, Northeast, and Central-West regions coverage was lower than the national average.

The National Immunization Program recently began to administer routine vaccination against hepatitis B for children under 1 year of age in areas considered to be at high risk for transmission of the hepatitis B and delta viruses (the western Amazon region and the state of Espírito Santo).

An estimated 62 million people, or 42.9% of the total Brazilian population (based on 1991 data) live in areas at risk for *malaria* transmission. In 1991 a total of 577,098 cases were reported, 42.5% caused by *Plasmodium falciparum*, 57% by *P. vivax*, and less than 1% by *P. malariae*. These figures indicate a rise in the number of cases in comparison with previous years. The annual parasite index (API) was 3.92 in 1989, 3.73 in 1990, and 4.01 in 1991. The states and territories in the Amazon region account for 98% of the malaria cases reported. *Anopheles darlingi* is the principal vector, although there is evidence of considerable transmission by vectors of the *A. albicansis* complex and the sporozoites of the parasite have been found in other anopheline species. The majority of cases in the Amazon region were seen in Mato Grosso (35.2%), Rondônia (24.0%), and Pará (22.7%). Of the total number of cases, 87% occurred in 79 *municípios*, each with more than 1,000 reported cases; in 38 of these districts the API was over 100 per 1,000 population. Localized malaria outbreaks have also occurred in some areas, such as in Foz de Iguazu in 1989, as a result of an increase in the anopheline population, coupled with immigration from the Amazon region. The incidence of cases among intravenous drug users has declined.

Chagas' disease control activities, which focus on eradicating triatomine bugs (especially *Triatoma infestans*), resulted in a 73% reduction in infested areas in the last decade. In addition, blood quality control programs proved effective in interrupting transfusional transmission of the disease. Excluding the state of São Paulo, where active transmission has been under control for a number of years, the estimated prevalence of seropositivity is 4.2%.

Brazil has extensive areas, particularly in the Northeast and in the state of Minas Gerais, in which *schistosomiasis* is endemic and positivity indices are high. Assessments of the impact of the control program—the

objectives of which are to eliminate the most serious forms of the disease and reduce the prevalence rate to under 5%—have shown significant reductions in the frequency of serious forms, with a corresponding drop in mortality rates. Studies carried out in 1985 in the Bahía area showed that the prevalence of infection had decreased from 11% in 1977 to 5.8%. The proportion of carriers with hepatomegaly declined from 90% to 31%, while the proportion affected by splenomegaly decreased from 18% to 3%.

The epidemiologic profile of *yellow fever* has changed as a result of the application of environmental sanitation measures, eradication of the vector in urban areas (1943), and introduction of the vaccine. The profile may change again, however, owing to the risk that the virus will become reestablished in urban areas. At present the disease occurs only in its jungle form (15 cases in 1991, with 8 deaths). The Ministry of Health has proposed the following control strategies: prevention of the urban form of yellow fever, reduction of the incidence of the jungle form, and intensification of yellow fever vaccination efforts.

In 1986 several factors—including vigorous trade and migratory activity between countries and a deficient entomological surveillance system—created favorable conditions for the reintroduction of the *dengue* vector *Aedes aegypti* and its rapid spread in urban areas of three Brazilian states. In addition, *A. albopictus* was introduced in the Southeast. Unconsolidated data show an incidence of 96,447 dengue cases, which occurred during several epidemic outbreaks. The control program is basically geared toward prevention and early detection of classical dengue and prevention of the hemorrhagic form.

In 1991 the disease reporting system recorded 950 cases of *visceral leishmaniasis* and 20,569 cases of *cutaneous leishmaniasis*. The cases of visceral leishmaniasis were concentrated in the Northeast, and important foci have been identified in the states of Pará and Amazonas and the territory of Roraima in the North. Cutaneous leishmaniasis also occurs primarily in the Northeast, although cases are seen in all states except Santa Catarina and Rio Grande do Sul.

Despite control programs, the number of cases of *rabies* in humans, which had decreased steadily until 1988, has shown a tendency to rise: 37 cases were reported in 1988, 53 in 1989, 75 in 1990, and 69 in 1991. In the latter year, 70% of the cases occurred in the Northeast region. The South has had no cases in years. Environmental changes have altered the epidemiologic dynamic of rabies, with bats now serving as important transmitters of the disease.

Tuberculosis is a leading cause of morbidity and mortality. Based on studies of the disease's prevalence among schoolchildren, the risk of infection was estimated at 0.5% in 1991, although a figure of close to 1%, or 100,000 new cases per year, would probably be more accurate. Based on that figure, it is estimated that reported cases represent about 80% of the total number of cases. The incidence of tuberculosis (all forms) decreased from 63.4 per 100,000 population in 1981 to 48.2 in 1990, which equals a mean relative reduction of 3.2% per year. Tuberculosis mortality declined 51.7% between 1977 and 1987—a mean annual reduction of 5.4%. Integrated health measures, use of short-course treatment regimens, and free distribution of tuberculosis drugs are among the strategies employed by the control program.

Leprosy, a persistent endemic disease in Brazil, is spreading epidemically and constitutes a serious public health problem. The incidence of the disease tripled between 1973 and 1991, rising from 6.8 to 20.6 cases per 100,000 population, while the absolute number of cases is estimated to have quadrupled. In 1990 there were 278,692 leprosy patients on record, the prevalence rate was 18.5 per 10,000 population, and 28,842 new cases were detected. The regional distribution of the disease is not uniform. The North and Central-West regions have the highest prevalence rates (44.4 and 38.5 per 10,000 population, respectively), a situation which is directly related to the poor socioeconomic conditions of the population in these areas. The leprosy control program focuses on early detection and appropriate treatment.

Filariasis has declined steadily in the state of Pará, but has increased in Pernambuco, where the slide positivity rate rose from 1.6% in 1982 to 5.0% in 1992.

The number of *plague* cases in the Northeast region has declined since 1982, when 151 cases were detected. Only 10 cases were seen in 1991 and 13 in 1992, all of them in both years in Bahia.

Trachoma has a high prevalence, especially in the Northeast region. Although its importance as a cause of blindness declined considerably following the introduction of a control program, the disease continues to be a public health problem. A 1992 survey carried out in selected states indicated a contagion rate of 8.0% and a prevalence of 10.1%.

Meningitis continued to show an endemic pattern during the 1980s. In the middle of the decade the incidence of meningococcal meningitis caused by serogroup B meningococci began to rise steadily, reaching epidemic proportions in some states. Since the start of the 1990s the incidence of serogroup B

meningococcal disease has declined while that of serogroup C disease has increased.

Congenital syphilis is a concern owing to the magnitude and impact of the problem and the difficulties in preventing and controlling it. A sizable proportion, estimated at 4%, of pregnant women in Brazil are positive by VDRL; however, the quantity of cases is not known.

Between 1980 and July 1993, 40,862 cases of *AIDS* were reported, making the cumulative incidence 30.1 cases per 100,000 population. The epidemic began in the early 1980s in the states of Rio de Janeiro and São Paulo. Since then all states have reported cases. Sexual transmission has been responsible for 60.2% of the cases, and transmission through blood transfusions has accounted for 27.2%. Among the population over 18 years of age there has been a notable increase in the number of cases acquired through heterosexual transmission. In 1986 this route of transmission accounted for 5.0% of cases, whereas in 1992–1993 it caused 23.4%. Intravenous drug use was responsible for 3.0% and 24.5% of the cases in those years, respectively. The number of *AIDS* cases in women has increased substantially since 1986, with the male-female ratio changing from 17:2 in that year to 5:1 in 1992. Of these cases, 90% have been in women over the age of 15. The growing prevalence of HIV infection among women of childbearing age has been accompanied by an increase in perinatal transmission, as evidenced by the rise in the number of cases in children under 2 years of age. The diseases most frequently associated with *AIDS* are candidiasis (54.0%), *Pneumocystis carinii* pneumonia (31.2%), and tuberculosis (19.9%).

The *cholera* epidemic struck Brazil in April 1991. The disease followed communication routes along the rivers of the Amazon basin, reaching the states of Amazonas and Pará. From there it spread, via overland or river transportation, to the state of Maranhão. By the end of 1992 the epidemic had extended into Paraíba and all the states of the Northeast, and in the early months of 1993 it reached Minas Gerais and Rio de Janeiro. As of 27 February 1993 a cumulative total of 33,273 cases had been reported—2,101 in 1991, 30,327 in 1992, and 1,295 in 1993. The fatality rate among reported cases was 1.6% in 1991 and 1.4% in 1992.

According to the National Health and Nutrition Research Project, in 1989 the prevalence of chronic *malnutrition* in Brazil was 15.4%, while that of acute malnutrition, as measured by weight-for-height, was 2.0%. However, these figures obscure enormous differences among regions, localities, and socioeconomic groups. In the Northeast region, for example, the prevalence of

chronic malnutrition was 27.3%, whereas in the South it was 8.1%. Chronic malnutrition is nine times more prevalent among low-income groups (30.0%) than among the segment of the population with the highest income (3.4%). In general, between 1975 and 1989 malnutrition showed a clear-cut downward trend and, notwithstanding persistent marked regional differences, a decrease of 61.4% was observed among children under 5 years of age. Several studies of retinol levels carried out between 1987 and 1989 found high levels of vitamin A deficiency in four states of the Northeast region. In 1991 the National Food and Nutrition Institute determined that in the Northeast 18.5% of children under 5 were suffering from anemia.

An estimated 4.5 million people in Brazil have *diabetes mellitus*. A multicenter study on diabetes conducted during 1986–1988 found the prevalence of the disease to be 7.6%, with higher rates in the South and Southeast regions.

Diseases of the circulatory system are the leading cause of death among the Brazilian population. Cerebrovascular disease is responsible for about 38% of all deaths from this group of causes. Next in proportional terms are diseases of pulmonary circulation and “other forms” of heart disease, followed closely by ischemic heart disease, mainly acute myocardial infarction. Hypertension is the underlying cause of 2% of deaths and constitutes an important risk factor for cardiovascular disease. Studies of multiple underlying causes of death carried out in São Paulo indicate that this disorder is associated with approximately 30% of all adult deaths. Other studies have shown the prevalence of hypertension to be 9.0% in the group aged 20–39 years, 36% in the group aged 40–59, and 63% in the group aged 60 and over.

In 1989 *malignant neoplasms* were the third leading cause of deaths from defined causes. Skin cancer, although it accounts for relatively few deaths, is the most common of all forms, representing up to 25% of all cancers detected. Overall, lung, stomach, and breast cancer are the next most common types, but there are regional variations. In the most developed regions the lung, colon, and breast are the most frequent sites, while in the least developed regions cancer of the uterine cervix and stomach predominate.

A national epidemiologic study of *oral health* in the urban population revealed a high DMF (decayed, missing, and filled teeth) index among all age groups. The average DMF value was 1–2 among 6-year-olds, 5.8 among 11-year-olds, and 27.2 among those aged 50–59. Half of all Brazilians were in need of periodontal prophylaxis and 7.5% of the population aged 50–59

needed surgical treatment. The survey also found that 0.2% of the population aged 15–19, 16.3% of the population aged 35–44, and 40% of the population aged 50–59 were missing teeth.

Data on *mental disorders* are unavailable for the country as a whole. One study carried out in 1990–1991 in three metropolitan areas estimated the overall prevalence of such disorders at between 31.0% (São Paulo) and 50.5% (Brasília), and the potential demand for mental health services at 19.0% in São Paulo, 33.7% in Pôrto Alegre, and 34.7% in Brasília. The principal mental health problem found by this study was neurotic disorders (especially anxiety and phobias), the prevalence of which ranged from 9% to 18%. Nonpsychotic depression was found in 14% of the women studied in one of the regions. Alcohol abuse or dependence was found to be 11 times more common among males than among females, and the prevalence was as high as 9%.

One of the consequences of the socioeconomic development patterns in the country has been an upsurge in *violence* in both urban and rural areas. Systematized data on the problem are scarce, but its magnitude can be measured in terms of mortality from external causes, which in 1989 were responsible for 15.3% of all deaths from defined causes and ranked second as a cause of death. Males were the most affected, accounting for 81% of deaths from external causes. Traffic accidents, which cause approximately 30,000 deaths per year, accounted for one-third of the deaths from this group of causes, and homicide was responsible for another third.

Systematized data for the state of Paraná indicate that there were 660 outbreaks of *food poisoning* between 1978 and 1992. Of the 585 confirmed cases, 72.3% were due to bacterial agents and 2.2% to chemical agents (the cause of the remainder was not determined). Homemade meals accounted for 46.6% of the cases, processed foods for 16.7%, and commercial meals for 16.5%.

Risk Factors

The presence of cholera has prompted several studies on the cost of diseases associated with lack or insufficiency of basic sanitation services, including water supply, sanitary sewerage, elimination of solid waste, and vector control. In February 1992 the Sanitation Division of the Ministry of Social Action, now the Ministry of Social Welfare, indicated that the country was spending around US\$ 2,500 million per year to treat

such diseases and mitigate their economic and social consequences.

According to the Ministry of Health, in 1992 the incidence of cholera was 13.66 per 100,000 population, while that of other waterborne diseases, including typhoid fever, leptospirosis, and intestinal infections, was 596 per 100,000.

One of the most serious environmental problems in urban areas is air pollution, the principal source of which is motor vehicles, which produce carbon monoxide among other pollutants. Concentrated economic activity, especially industry, is another source of air pollution in some regions. In the São Paulo metropolitan region, air quality monitoring in 1991 showed that total particulate concentrations exceeded safe levels. Significant headway has been made in reducing pollution from stationary sources, and a program is under way to reduce polluting emissions from motor vehicles.

No detailed data are available on smoking among the Brazilian population, but studies conducted in the South and Southeast regions have indicated that prevalence rates are higher among males than females. An estimated 63% of adult males smoke, as compared to 33% of adult females.

Owing to social problems, underemployment, and the continued lack of accurate information, the majority of occupational accidents are not included in official statistics. Between 1986 and 1991 the Ministry of Social Welfare recorded 5,560,425 such accidents, with 28,966 deaths and 126,704 disabilities. The number of deaths from occupational accidents and diseases is rising as a result of unhealthful conditions and the presence of risk factors in the workplace. The death rate per 10,000 accident victims climbed from 46.0 in 1987 to 70.6 in 1991—a 53% increase. The most frequent occupational illnesses are hearing loss due to excessive noise, occupational dermatoses, poisoning by metals (especially lead), illness resulting from exposure to solvents, and pneumoconiosis.

In the Amazon region, mercury has been used extensively since 1980 in connection with metal and diamond mining activities. Several studies by Brazilian universities and institutions have shown that mine workers are being exposed to mercury vapors because of carelessness and lack of appropriate protective measures. In each of the 16 years between 1976 and 1992 an average of 50,554 kg of mercury was discharged into the environment as a result of mining in the Amazon region. Mercury that is not reused in gold processing is disposed of, contaminating watercourses and fish. Mercury levels in some watercourses exceed the per-

missible limits established by the National Environmental Council.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

The institutional organization of the health sector in the 1980s and the early 1990s was shaped by the political, economic, and social situation. The Federal Constitution of 1988 defines health as a right of all persons and attention to health as a duty of the State, establishing social and economic policies aimed at reducing the risk of disease and ensuring universal and equal access to services and activities for the promotion, protection, and recovery of health. The Constitution also establishes the Unified Health System (UHS), which is organized in accordance with the strategy of decentralization and provides for unified management at each governmental level, comprehensive care, and community participation. The Organic Health Law establishes the legal basis for the UHS and stipulates the conditions necessary for the promotion, protection, and recovery of health and the organization and operation of health services. The IX National Health Conference (1992) encouraged the participation of all segments of society—health service users, public and private health care providers, producers of goods, legislators, and administrators—and laid the foundations for addressing issues relating to funding and decentralization of health activities to the *município* level. The structural and institutional reforms that have been introduced have prompted considerable public debate, and the formation of municipal and state health councils has encouraged public participation in health management.

The health system is characterized by “exclusionary universalization,” in which expansion of the system’s coverage has been accompanied by the emergence of characteristics that serve as rationing mechanisms—especially poor quality of public services, whether they are provided by State entities or private providers under contract with the State. As a result, the middle and upper classes as well as the most qualified health care personnel remain outside the public health care system. This phenomenon has led to the expansion of the subsystem of complementary health services, an offshoot of the subsystem of highly specialized services. In the area of social security, the legal action to prevent the assessment of social security contributions

on the basis of the sales and profits of businesses has had profound repercussions on health financing.

The expansion of the public subsystem’s coverage through increasing incorporation of the groups with the least purchasing power has lowered the quality of the services provided and has pushed the upper echelons of society toward the complementary subsystem. However, these segments of the population continue to depend upon the public high-technology subsystem for costly services.

From the political standpoint, the exclusion of the most influential social groups from the expanding public system has led to an erosion of the political base of support for the public subsystem, thus perpetuating a vicious cycle: higher quality—exclusion of organized sectors—lower demands for better services—higher quality. This complex set of interactions—involving users, public and private providers, businesses and employees—has shaped the institutional organization of the Brazilian health sector, which is like a pyramid composed of three subsystems. At the apex is the high-technology subsystem, comprising highly specialized facilities. This subsystem serves 3% of the population, but consumes 30%–40% of UHS resources. At the intermediate level is the complementary health care subsystem—the private sector—which in the 1980s underwent tremendous expansion and by 1989 was serving 31,140,000 Brazilians, or 22% of the country’s population. This subsystem generates spending of US\$ 2,423 million per year and encompasses five medical service modalities: group practice, cooperative practice, self-management, health insurance, and health maintenance plans. Finally, at the base is the public health care subsystem, made up of entities at the federal, state, and *município* levels and of private services under contract to the State. This subsystem serves 110 million people, although it does so under increasingly adverse circumstances, given the crisis of the Brazilian State.

Financing of Services

Taking into account public-sector resources and the amounts spent by businesses and families, Brazilian society invests 4%–5% of the GDP in health services. In 1989 public-sector resources from federal, state, and municipal fiscal revenues accounted for close to 75% of the total amount invested, and the Federal Government contributed 80.9% of all public spending on health.

The resources mobilized by the Government, as established by the 1988 constitution, come from the social security budget, under which funds are allocated for social security, health, and social welfare, as well as for the workers' insurance fund, which finances unemployment insurance. That budget, one of those included under the Annual Budget Law, is funded by the contributions of employees and the amounts paid by employers based on their payrolls (45%); the contributions of businesses and financial institutions based on their sales and profits (20%–25%); regular Treasury funds (close to 7%); and other revenues.

Part of the health resources of the Federal Government are allocated to services under its direct responsibility (Ministry of Health, armed forces ministries, Ministry of Education and Sports, and university hospitals); part is used to pay for private services contracted by the UHS; another portion is transferred to the states and *municípios* to cover the cost of the services provided by them; and some funds are invested. The resources mobilized by the states and *municípios*, which account for about 20% of total public spending, are derived from tax revenues (mainly the tax on goods and services) and other contributions, and are utilized mostly to maintain the services at these levels.

During the period 1980–1991 total federal spending increased 6.1%, but per capita expenditure fell 13.4%. Spending actually dropped twice during that period: once in 1983–1984, when there was a real cumulative reduction of 16.6% as compared to 1982, and a second time in 1990–1991, when there was a real cumulative reduction of 30.6%. As a percentage of GDP, federal spending ranged from 1.5% in 1983 to 2.5% in 1989. In 1991 the proportion was 1.9%. The reduction in per capita federal spending is explained by the economic crisis, which caused revenues to be lower than expected, and by the legal action taken to prevent the assessment of social security contributions on the earnings of businesses, which reduced transfers of social security tax funds to the health sector.

In regard to federal spending on health, by category of spending, the proportion allocated for capital expenditures (investment) in recent years has been about 6%, which is low given the amounts needed to maintain and expand the public health services system. The proportion allocated to ordinary expenditures decreased between 1980 and 1990 owing to a reduction in spending on services provided by third parties, which fell from 63.0% to 25.6% of the total. On the other hand, there was a major increase in intragovernmental transfers (which rose from 1.2% to

22.1% of the total), as a result of the policy of decentralization of financial resources to the states and *municípios*.

Private spending on health has tended to remain constant in recent years, following a period of major growth during the 1980s. That growth was largely explained by the emergence of new forms of health insurance and prepaid health care plans.

Total spending on health, as estimated by the Institute for Research in Applied Economics, was US\$ 18,789.8 million for 1989, which was 4.2% of the GDP. Public sources provided 74.2% of this total and private sources, 25.8%. Since 1989 spending by the Federal Government has tended to be lower, holding in the range of US\$ 7,000 million to 8,000 million.

Environmental Services

In 1992, 89.6% of the urban population and 33.5% of the rural population had running water, but only 68% of the population was receiving water that met WHO quality standards. According to the Institute for Research in Applied Economics, close to 23.3% of the *municípios* in Brazil have no type of water treatment and 32% use only simple disinfection, which means that some 13 million urban inhabitants lack adequate access to safe drinking water.

A 1989 study by the Brazilian Geography and Statistics Institute Foundation, the results of which were published in 1993, indicated that 92% of the *municípios* did not perform any type of treatment on domestic wastewater. According to projections by the Brazilian Sanitary Engineering Association (ABES) for December 1992, 40.2% of the urban population lived in dwellings connected to sewerage systems and 43% had localized excreta disposal systems. ABES estimates that only 16.5% of domestic wastewater receives some type of treatment. Characteristic regional inequalities exist in the coverage of sanitary sewerage systems.

According to the Brazilian Geography and Statistics Institute Foundation, in 1989 the metropolitan areas in the South and Southeast regions of the country had adequate overall sanitation coverage (generally through sewerage systems, or through septic tanks), with a mean level of 83.3% (63.6% for households with incomes up to two times the minimum wage). The other regions had considerably lower coverage levels: in the Recife metropolitan area, for example, only 27.6% of all dwellings were connected to a satisfactory sewerage system.

The only data available on the evolution of coverage pertain to government-owned companies providing basic sanitation services during the period 1988–1990. This information indicates that the population being supplied with water increased from 74 million to 81 million (9.2%) and the number of house connections rose from 13,754,629 to 14,878,112 (8.2%). As for sanitary sewerage, the population served by government-owned sanitation companies climbed from 26.9 million to 30.4 million (12.6%), and the number of sewerage connections increased from 4,043,518 to 4,573,119 (13.1%).

It should be noted, however, that government-owned sanitation companies operate only part of the systems and serve 78% of the population supplied with water and 66.5% of the population that has sanitary sewerage.

Average per capita water use is estimated at 270 liters per day in urban areas and 80 liters per day in rural areas. In urban areas 80% of the population receives water from surface sources, and 20% is supplied from underground sources. About 78% of water systems monitor the quality of the water supplied (59% test for fecal coliforms and 98.4% test for residual chlorine).

In regard to solid waste, 241,614 tons of refuse were being collected each day in 1989, 76% of which were deposited into open-air dumps or in flooded areas. In 1989 hospital wastes were being collected in 2,516 of the 4,425 *municipios*, and 74% of the *municipios* that were collecting such wastes were depositing them in open-air dumps.

Technological Products

The 1989–1992 quadrennium saw continued problems in regard to maintenance of adequate supplies of essential drugs within the health services network, mobilization, management, and rational use of resources, and assurance of the geographic and economic accessibility of health services to the low-income population; the health sector's efforts to respond to these problems lacked the necessary coordination and direction. The successive governments announced policies on drugs that addressed certain limited aspects of the issue but failed to incorporate the whole program area. In 1990 the total value of the pharmaceutical market was estimated at US\$ 4,000 million. Products sold by commercial pharmacies accounted for US\$ 2,700 million, or 70.5% of the total market. Of the 200 most widely sold products, which represent 38.9% of the pharmacy

product market, only 3.1% are currently under patent. There are some 600 pharmaceutical companies in the country, 520 of which are domestically owned. Fifty major companies control almost 90% of the market; of these, 20 are multinational firms, one of which is a domestic-foreign partnership.

The 16 public-sector laboratories supply the public health services network directly or through the Central Drug Exchange (CEME); these laboratories meet approximately 10% of CEME's demand. Successive political-institutional crises, together with the policies of CEME itself, have seriously eroded the productive capacity of the official laboratories responsible for 3.5% of the country's total production.

The National Program for Self-sufficiency in Immunobiological Products produces vaccines and sera of adequate quality and in sufficient amounts to meet national needs. Between 1986 and 1991 the program invested some US\$ 100 million, and it intends to invest a similar amount over the next 5 years to construct new production laboratories, purchase equipment, train technical and professional personnel, and conduct biotechnological studies with a view to developing new technologies for vaccine production and quality control. The aim of the program is to make Brazil self-sufficient in the production of measles vaccine; the triple vaccine against diphtheria, pertussis, and tetanus (DPT); the double vaccine for adults (Td); the double vaccine for children (DT); tetanus toxoid (TT); BCG vaccine; canine and human rabies vaccines; yellow fever vaccine; the vaccine against groups A and C meningococci; and antivenomous, antitoxic, and anti-rabies sera. This program is carried out in seven laboratories located in the South and Southeast regions.

Dental, medical, and hospital equipment is supplied by 526 domestic companies, 223 of which are affiliated with the Brazilian Association of Dental, Medical, and Hospital Equipment Companies. Domestic production totaled US\$ 437 million in 1986 and US\$ 960 million in 1990, but it decreased to US\$ 672 million in 1991. Equipment imports, which amounted to US\$ 138 million in 1986 (24.0% of the market), rose to US\$ 288 million in 1990 (23.1% of the market) and US\$ 415 million in 1991 (38.2% of the market).

The performance of highly specialized procedures is governed by standards and regulations defined at all levels and is monitored and evaluated by the Federal Government. The subjects of these regulations include cardiovascular surgery and implantation of cardiac pacemakers, cancer treatments, orthoses and prostheses, and kidney transplants. International standards are applied in the certification of equipment.

TABLE 3
Distribution of health professionals actively practicing and affiliated with professional associations, for the country as a whole and the administrative regions, per 10,000 population, Brazil, 1992.

| Specialty | Brazil | North | Northeast | South | Southeast | Central West |
|---------------------|--------|-------|-----------|-------|-----------|--------------|
| Medicine | 14.22 | 5.93 | 7.95 | 12.57 | 20.52 | 13.50 |
| Dentistry | 8.07 | 2.78 | 3.78 | 7.70 | 11.99 | 8.01 |
| Nursing | 3.87 | 2.19 | 2.78 | 3.78 | 4.99 | 3.37 |
| Nutrition | 1.02 | 0.18 | 0.73 | 1.09 | 1.35 | 0.83 |
| Physical therapy | 1.37 | — | — | — | — | — |
| Veterinary medicine | 1.78 | 0.90 | 1.14 | 3.55 | 1.54 | 3.06 |

Source: General Coordination Office for the Development of Human Resources for the Unified Health System; professional associations.

During the period 1980–1989 between 4% and 5% of the national budget (0.4% to 0.5% of the GDP) was allocated for scientific and technological development. In the specific area of health, from 1987 to 1989 four research promotion institutions spent US\$ 241.1 million, or about US\$ 80 million annually, which represented 16.7% of the total resources applied to the production of knowledge in all areas.

Available Resources

In 1989 the country had 34,831 health establishments: 22,706 (65.2%) belonged to the public health services network and 12,125 (34.8%) were private-sector facilities. Inpatient hospital services were provided at 6.8% of the public and 43.2% of the private establishments. Hospital beds in public institutions are distributed fairly evenly throughout the administrative regions, with the number ranging from 0.72 beds per 1,000 population in the South to 0.9 per 1,000 in the North. The 403,365 beds in the private sector, on the other hand, are quite unevenly distributed, with figures per 1,000 population for the various regions as follows: North, 1.1; Northeast, 1.9; Southeast, 3.2; South, 3.4; and Central-West, 3.3. The shortage of private-sector hospital beds in the North and Northeast is the result of the widespread policy of investing less in the neediest areas.

Human Resources

The distribution of health services and professionals in the various regions is very unequal. Human resources are concentrated in the most developed regions and in the state capitals. Only nursing personnel are more or less evenly distributed (Table 3). There are 208,966 practicing physicians in the country, approximately 29% of whom are female. The Southeast has more than half of all physicians (61.5%), while the Amazon area and North suffer from extreme shortages of these professionals. Physicians make up 46.8% of the total professional work force in the health field. There are also 118,609 dentists, 57,047 professional nurses, 14,906 nutritionists, 20,161 physical therapists, and 26,116 veterinarians.

The training of health professionals underwent a 6% reduction between 1985 and 1990. Training in the various health professions is provided throughout the country in 581 degree programs, including 80 in medicine (7,182 graduates in 1989), 102 in nursing (3,230 graduates), and 81 in dentistry (5,366 graduates). Female participation in the health work force increased from 40% to 60% during the period 1970–1980 and rose to 80% by 1992. This change has had repercussions on the earnings of health workers, since historically female workers have been paid less. The pay differential not only is the cause of numerous conflicts but also points up the fact that salaries in the sector are generally low, particularly in public-sector establishments.

BRITISH VIRGIN ISLANDS

GENERAL HEALTH SITUATION AND TRENDS

The British Virgin Islands comprises several islands, islets, and cays; the five largest islands are Tortola, where the capital and the seat of government are, Virgin Gorda, Anegada, Jost Van Dyke, and Salt Island. The total land area is 153 km² and the population was 16,600 in 1991.

The British Virgin Islands is a dependent territory of the United Kingdom with internal self-government. The executive branch is comprised of a Chief Minister and four cabinet members, with the Governor acting as chairperson and representing the British Government. The legislative branch includes Cabinet Ministers, who have specific responsibilities for various aspects of national development, and other elected representatives. There is no local government machinery or town council, although district officers have been appointed as administrative representatives on many of the nearby islands.

Health and Living Conditions

The economy is based primarily on tourism and on the financial services sector, with emphasis on international business company registration and trust services, although efforts are being made to diversify the economic base. The per capita GDP increased from US\$ 7,093 in 1983, to US\$ 9,492 in 1987, and to US\$ 11,000 in 1991. The territory relies on local revenue and loans from local and international services to finance its capital and recurrent expenditures. At this time, aid represents less than 6% of its financial requirements.

An average of four occupants live in each household, although in isolated cases there is serious overcrowding. The British Virgin Islands has no zoning legislation, so residential, commercial, and industrial buildings can be located in the same area.

Adult literacy is high at 98%, and all children up to 15 years of age are enrolled in schools. Recently, tertiary-level education was introduced through the

British Virgin Islands Community College, which is linked to the Hocking College (USA), and a fellowship program, which allows nationals to study overseas. Unemployment is estimated at under 2%.

There is sea and air travel between islands. All areas except Roadtown are considered rural, although significant populated areas have developed in some sections of Tortola.

Population

The 1991 population census revealed an increase from 12,240 in 1987 to 16,643 in the census year. Males represented 51% of the population and females, 49%; 26.6% of the population was under 15 years old (down from 34% in the mid-1980s) and 5.8% was 65 years old and older. Females in the age group 15–44 years old showed a moderate increase, from 23% of the total population between 1985–1987, to 27% in 1991. Table 1 presents the 1991 population by age and sex.

The population has undergone dynamic shifts because of high immigration and emigration rates. The net migration in 1990 was 364. Immigration by other Caribbean nationals to the territory has increased, with most immigrants coming from the English-speaking Caribbean and the Dominican Republic to work mainly in tourism and construction.

There also have been significant changes in the population distribution, with a marked increase in Virgin Gorda, which has a developing tourist economy, and a decrease in Anegada. In 1992, Tortola had the largest population of all the islands, with 13,582 inhabitants (81.6% of the total population); Virgin Gorda had 2,495 inhabitants, Anegada 156, and Jost Van Dyke 141.

The fertility rate per 1,000 women aged 15–44 years old has shown a steady decline, from 88.0 in 1987 to 67.4 in 1991. The birth rate remained fairly constant at 19.3 per 1,000 population in 1991, compared to 18.0 in 1990 and 22.0 in 1987. The average annual birth rate over the 1987–1991 period was 17.9 live births per 1,000 population. Births to teenage mothers as a percentage of all live births was 9.9% in 1991, and 11.6% in 1992.

TABLE 1
Population by age and sex, British Virgin Islands, 1991.

| Age group (years) | Total | | Male | | Female | |
|----------------------|--------|-------|-------|------|--------|------|
| | No. | % | No. | % | No. | % |
| Total | 16,643 | 100.0 | 8,569 | 51.5 | 8,074 | 48.5 |
| 0-4 | 1,611 | 9.7 | 815 | 4.9 | 796 | 4.8 |
| 5-14 | 2,815 | 16.9 | 1,423 | 8.6 | 1,392 | 8.4 |
| 15-24 | 2,818 | 16.9 | 1,397 | 8.4 | 1,421 | 8.5 |
| 25-34 | 3,728 | 22.4 | 1,911 | 11.5 | 1,817 | 10.9 |
| 35-44 | 2,579 | 15.5 | 1,363 | 8.2 | 1,216 | 7.3 |
| 45-54 | 1,359 | 8.2 | 729 | 4.4 | 630 | 3.8 |
| 55-64 | 761 | 4.6 | 403 | 2.4 | 358 | 2.2 |
| 65+ | 972 | 5.8 | 528 | 3.2 | 444 | 2.7 |

Source: Statistical Unit, Ministry of Finance, 1991.

The crude death rate for 1991 was 4.3 per 1,000 population, the same as in 1990. The average annual death rate over 1987-1991 was 4.8. In 1990, life expectancy at birth was 71.8 years for females and 70.3 for males.

Mortality

Deaths that occur in hospitals are certified by a medical practitioner and reported to the National Registration Office. Deaths that occur at home are reported by district registrars to the National Registration Office.

Infant mortality fluctuated between a high of seven deaths in 1987 and a low of three deaths in 1990. In 1987-1991, of 1,354 total births, there were 19 stillbirths. Of the 1,335 live births, there were 26 infant deaths, 22 of them in the neonatal period. In the same 5-year period, there were two deaths in children 1-4 years old. These data can be translated into the following average annual rates for the period: stillbirth rate per 1,000 total births, 14.0; neonatal mortality rate per 1,000 live births, 16.5; and infant mortality rate per 1,000 live births, 19.5. There were five infant deaths in 1991, all of which occurred in the first 24 hours of life.

Of the total deaths, 53% occurred in persons 65 years old and older.

Of 205 total deaths from all causes (including ill-defined conditions) in 1988, 1989, and 1991, 50 (24.4%) were attributed to heart diseases (ICD-9, 410, 414, 427.5); 28 (13.7%), to malignant neoplasms (140-208); 17 (8.3%), to cerebrovascular diseases (430-436); 19 (9.3%), to drowning (E910.8); 15 (7.3%), to pneumonia-bronchopneumonia (480-486); and 16 (7.8%), to congenital anomalies and to conditions originating in the perinatal period (748.9, 769, 770). Together, these six groups of causes covered 71.7% of total mortality in

the 3 years (1988, 1989, 1991) combined. It was noted that the majority of deaths due to malignant neoplasms occur in persons living on the western end of Tortola.

During 1987-1991 there was only one maternal death (in 1987), resulting in an average yearly maternal mortality rate of 7.5 per 10,000 live births for the period.

Morbidity

Although more than 50% of the territory's population is estimated to seek medical care from private physicians, available data on morbidity are from public facilities, and do not show morbidity at private clinics. Health center and hospital data indicate that acute respiratory infections, dermatologic problems, and gastroenteritis are important causes of morbidity among children; mental disorders and injuries stand out among adolescents and adults; and circulatory disorders, hypertension, diabetes mellitus, and degenerative diseases are major causes of ill health among the elderly.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

Of the 26 total infant deaths in 1987-1991, 85% (22) occurred during the neonatal period. Between 1988 and 1991, 90% of infant deaths occurred during the first week of life.

Certain conditions originating in the perinatal period (ICD-9, 760–779) is the leading cause of hospital admissions for children under 5 years old. In 1991, 24 children in this age group were hospitalized with this diagnosis. Acute respiratory infection ranked second (eight children under 5 years old hospitalized), followed by gastroenteritis (six children hospitalized) and bronchopneumonia (four children hospitalized).

In 1991, 21% of infants born were considered high-risk births because of low Apgar score, multiple births, cesarean sections, low birthweight, and prematurity. In 1990, 8% of newborns had low birthweight (less than 2,500 g).

The main health problems in children under 5 years old at health centers/clinics are skin rashes and skin infections, allergic reactions, obesity, and acute respiratory tract infection.

The nutrition status (Caribbean standard) among children under 5 years old attending child health clinics in 1991 was severe malnutrition, 0%; mild to moderate malnutrition, 2%; normal, 77%; obese, 21%.

The school-age population (5–16 years old) including pre-primary, primary, and secondary schools was 3,681 in 1990. The main health problems among pre-primary and primary students are dental caries, skin rashes and/or infections, allergic reactions, and minor injuries. Problems affecting high school students are injuries, fever, coughs and colds, allergic reactions, and dysmenorrhea.

Adolescent and Adult Health

Mental disorders occurring among adolescents and adults are mainly related to substance abuse psychoses, and account for a high percent of hospital admissions. Injury related to traffic and other accidents also is common.

Mental disorders, particularly among those aged 25–44 years old, ranked highest for hospital admissions from 1988 to 1991. Diabetes, hypertension, injury, heart disease, and complications relating to pregnancy are other leading causes of morbidity. In 1991, mental disorders (ICD-9, 290–313) was the leading cause of hospitalization in Peebles Hospital, with 129. Pregnancy complications (640–666) ranked second with 74 hospitalizations, followed by diabetes mellitus (250) with 69, heart diseases (410–428) with 61, hypertension (401) with 52, and fractures/open wounds (800–828) with 47 hospitalizations. Asthma (493) and concussion (850) also were important, with 25 and 21 hospitalizations, respectively, in 1991. It should be noted that patients of all ages are included in these numbers.

Births to teenage mothers represented 12.8% of total births in 1988, 9.9% in 1991, and 11.6% in 1992. The average age of teenage girls giving birth increased from 16 in 1987 to 18 in 1990. The average age of women aged 15–44 years old giving birth was 27.3. Family life education and family services are available to teenage girls. In a target population of 638 females aged 15–19 years old, 12.5% used family planning services in 1990.

Hypertension and diabetes continue to be the main causes of morbidity, particularly in the age group 45 years old and older: 72% of persons with hypertension admitted to hospital and 80% of persons with diabetes were 45 years old and older. Cerebrovascular disease associated with hypertension is a leading cause of mortality.

The main reasons for hospitalization of diabetics are for stabilization and for treatment of infections, especially those of the upper respiratory tract.

Health of the Elderly

The main causes of mortality and chronic ill health in this group are cardiovascular and cerebrovascular diseases and malignant neoplasms. Arthritis and osteoarthritis are common causes of hospitalization.

Diseases and Health Impairments

In 1988, 13 cases of *dengue fever* were reported, and since then, there have been isolated reports. No cases of *cholera* have been reported.

Between 1987 and January 1992, 10 persons were reported as being HIV-positive and 6 as having AIDS; 3 of those confirmed as having AIDS have died. Of 2,304 VDRL tests performed, 65 (2.8%) were positive in 1988, as compared to 1,545 tests with 8 positives in 1992 (0.5%). In 1988, 45 persons tested positive for *gonorrhea*.

One case of *tuberculosis* was reported in 1988.

Mental disorders rank first as a cause of hospital admissions, mostly as recurring episodes of psychosis. Many of the younger clients with psychiatric problems also use illegal drugs.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

The Government's stated policy is to provide both public and private comprehensive health care, with

special focus on women, children, the elderly, the mentally ill, and the handicapped. The national health plan calls for increased efforts to reduce environmental health hazards, and identifies the need for involving the community in planning and mobilizing resources to improve the health of its members. More specifically, the plan provides for: (a) an environmental health program for the control of diseases through food services investigation, waste disposal, water inspection, and other measures; (b) an immunization program to reduce morbidity from communicable diseases; (c) a surveillance program for the reduction of existing communicable diseases and prevention of the introduction of these diseases into the territory; and (d) the strengthening of community health services and hospital facilities.

Free medical and hospital care is extended to pregnant women, children, the police, firemen, the elderly, and the mentally ill. In an effort to strengthen services at the community level, the Community Health Services Department was established in 1990. The social service unit of the health department was established and became operational in July 1991; it is headed by a social worker, whose primary responsibilities include providing social services support for the Department, particularly regarding mental health and AIDS prevention and control programs.

The Public Health Act provides the statutory means of promoting and preserving the population's health, and grants the Minister Responsible for Health duties, powers, and functions. This legislation covers areas such as disease prevention, treatment, and control; health education; environmental health; and the appointment of advisory boards and public health officers.

Organization of Services

The responsibility for government health services falls under the Ministry of Health, Education, and Welfare. Policy decisions for health services are made by the Minister, in consultation with the Chief Medical Officer, other senior technical officers, and the Permanent Secretary, who is responsible for the Ministry's daily administration. Technical responsibility for health services rests with the Chief Medical Officer.

Personal Health Care Services

Infrastructure. Functionally, health services are divided into community and hospital services operat-

ing as a two tier system, and are offered by government and the private sector.

The local or primary level of care is the first, most basic level of care. Services in Tortola are offered through one main health center in Roadtown and five health clinics strategically located in Tortola to ensure coverage. The Roadtown Health Center is located in the Peebles Hospital compound, and functions as the main referral center for the districts, although persons from any district may go directly to the Hospital's casualty department. The most distant health clinic in Tortola is only 10 miles away, or 20 minutes by road from the Roadtown Health Center and Peebles Hospital.

The population in the catchment area for the Roadtown Health Center increased from 3,382 in 1989 to 9,106 in 1993. Tortola's health clinics are used by their respective communities, mainly for child health services, and by older people; the five health clinics are Capoons Bay, target population, 1,000 in 1993; Carrot Bay, target population, 468; Cane Garden, target population, 409; Long Look, target population, 1,425; and East End, target population, 1,452.

Other available personal care facilities include a mental health center, a dental unit, and a family planning unit.

The island of Virgin Gorda has two health facilities, one in the Valley (with two beds, target population of 1,913 in 1993) and the other in North Sound (with one bed, target population of 582). Both have inpatient facilities for deliveries, emergency care, and short stays. The clinic in Virgin Gorda is staffed by a resident physician, a public health nurse, a midwife, and a senior nursing assistant. There is a resident midwife at North Sound. One nurse is assigned to the Jost Van Dyke Health Clinic (target population of 141 in 1993) and one to Anegada (target population of 156).

Secondary care is provided at the 50-bed Peebles Hospital in Tortola, which offers medical, surgical, obstetric, and pediatric services, as well as emergency and ambulatory care services. Outpatient services are casualty (emergency), surgical, medical, gynecological, dermatology, ophthalmology, and pediatrics. Diagnostic and other support services include laboratory, X-ray, pharmacy, and physiotherapy. An average of 3,200 persons attend these clinics annually.

The Adina Donovan Home, a 26-bed residential facility for the elderly, is managed by the Ministry of Social Services.

Private facilities consist of the 8-bed Bourganvillea Hospital, nine private clinics, two dental offices, three pharmacies, and two laboratories. It is estimated that more than 50% of medical care at the primary level is provided by private physicians.

More specialized medical services are provided through referrals to regional health institutions or by specialists who visit the territory. Some clients who can afford to, seek care in the United States Virgin Islands or Puerto Rico.

Coverage. Prenatal care is provided at public health facilities and by private doctors. In 1991, 33.3% of mothers who delivered in Peebles Hospital attended government clinics, compared to 14% in 1989 and 29.5% in 1990. Of all prenatal visits, 28% were made in the first trimester, 54% in the second trimester, and 18% in the third trimester.

Pregnant women are encouraged to attend clinic by the 12th week of pregnancy. All clients are seen and examined by the obstetrician, and there are established criteria for identifying high-risk clients, so that they are detected early and receive prompt treatment. Hemoglobin levels are assessed and those with anemia are treated. VDRL tests are done and tetanus toxoid is given. A maternal "passport," which records the status of pregnancy, is given to clients and used to provide information to health personnel, particularly between levels of care. In 1991, 98 prenatal clinic sessions were registered, with 407 attendances; 19 women were identified as having high-risk pregnancies.

Pregnant women attending government clinics, as well as those attending private physicians' offices, are referred to Peebles Hospital for delivery. The average yearly number of deliveries is 270; all deliveries are attended by qualified health personnel—96.7% in hospital and 3.3% at health clinics by midwives. The total obstetric bed occupancy rate is 33%–35%. The average length of stay for normal deliveries is 2 days. Cesarean sections account for approximately 12% of deliveries.

A public health nurse visits the maternity unit at Peebles Hospital daily to collect information regarding delivery, management, and discharge of clients. Referrals are made to district clinics. Postnatal visits are made to homes on the third, fifth, seventh, and tenth day after delivery.

Mothers and babies return to clinic at 6 weeks for postnatal assessment; coverage ranges between 95% and 100%. In the Roadtown area in 1990, 432 postnatal visits were made to 150 women. There were 330 mothers who attended postnatal clinics, 27 more than those delivered in a hospital or health center; these 27 gave birth outside the territory.

Child health services include developmental assessment from 0–4 years old, monitoring of nutritional status based on age for weight, plotting and interpreta-

tion of the growth chart, and immunization according to schedule.

The target population under 1 year old in 1991 was 341, and coverage in the group aged 0–11 months was 330, or 97%. Twenty-five percent of children registered at clinics in 1990 were born outside the British Virgin Islands. Many of these children are reported to be from the English-speaking Caribbean and the Dominican Republic.

Immunization coverage of children under 1 year old in 1990 and 1991 was 100% and 90%, respectively, for BCG, 96% and 98% for DPT, 98% and 96% for OPV, and 96% and 84% for MMR. The decrease in measles coverage may be due in part to the fact that children immigrating to the British Virgin Islands may not have been fully immunized.

Upper respiratory tract infections and gastroenteritis are usually managed at child health clinics through the use of protocols (oral rehydration therapy in the case of gastroenteritis).

As part of the school health program, a child receives three physical examinations—the first on admission to school, another in middle school, and the final one before leaving school. Follow-up care is done by nurses and consists mainly of screening for nutritional, vision, hearing, and other defects. Hemoglobin testing is done and booster immunizations administered.

Family planning services are offered at the family planning clinic in Roadtown and at district health clinics. There were 1,764 participants registered in 1991, of which 124 were new participants; 156 Pap smears were conducted. Of the clients using this service, 79% are between 20–34 years old and 5.7% are between 15–19 years old.

A plan for the prevention of cholera has been implemented.

Regarding the battle against AIDS, the National AIDS Committee was renamed the National AIDS and Sexual Health Committee, reflecting current emphasis on sexual health. All blood for transfusion is screened for HIV, and testing is done on some groups, such as immigrants. Self-exclusion information for blood donors has been developed.

Community awareness and education, particularly targeting vulnerable groups, adolescents, and young adults are key components of the national AIDS program. Private physicians improved their AIDS and HIV-positive reporting, and there are ongoing efforts to strengthen and improve data management and epidemiologic surveillance, not only for AIDS, but also for other communicable diseases.

There are protocols for the management of persons with hypertension and diabetes, which are the two main health problems in adults, particularly among those 45 years old and older. There is one hypertension and diabetic clinic each in Roadtown, East End, Capoons Bay, and Virgin Gorda. One hundred clients with hypertension are registered at the Roadtown Health Center and 220 diabetics are registered island-wide. The main objective of control and management efforts is early detection, treatment, and counseling to promote behavior modification and lifestyle changes. At 73 diabetic clinic sessions in 1991, there were 1,657 attendances by 206 persons. A national diabetic association lends support to its members.

Social changes have changed traditional patterns of caring for the elderly. The Adina Donovan Home offers residential care for 26 senior citizens. Those with health problems are referred to the hospital or medical officer. Public health nurses visit the homes of the elderly in their respective districts. There were 120 elderly persons visited on a regular basis in 1991.

Immigration by other Caribbean nationals to the territory has increased, rendering the health of immigrants an issue of concern. In the process of getting settled in a home and job, some new arrivals tend to move between districts, making it difficult for health personnel to contact them or provide follow-up care. In 1991, 59 immigration clinic sessions were held for 1,047 persons, and in 1992, 953 persons were seen at 39 clinic sessions. In an effort to control the importation of communicable diseases, persons who immigrate to the British Virgin Islands are required to produce evidence of a medical examination, as well as negative laboratory test results for VDRL, HIV, tuberculosis, ova, and parasites.

Regarding oral health, the dental unit is located in Roadtown and is staffed by a dental officer, a dental hygienist, and two dental assistants, who also visit Virgin Gorda, Jost Van Dyke, and Anegada. The specific goal of the program is to reduce the DMF (decayed, missing, and filled teeth) and periodontal disease indices. Services focus on early diagnosis and prompt treatment to prevent dental disease progression and recurrence, as well as on providing rehabilitation and limiting disability.

Oral screening of schoolchildren reveals high DMF indices. The current school-based fluoride mouth rinse program was started because of high DMF values in schoolchildren and the proven benefits of fluoride mouth-rinsing. In 1991, 15 schools were visited and oral inspections were carried out; as a result, 350 students were referred for curative treatment.

The community mental health program focuses on the treatment of individuals in their own communities. Home visits to clients include monitoring of medication, administration of long-acting medication, family counseling, and the promotion of self-care. Visits also are made by the mental health staff to the prison and geriatric home when necessary. The drug rehabilitation program was suspended in 1991 due to financial constraints.

In 1991, 104 new clients were registered at the mental health center, and there were 1,795 client contacts—1,151 at the weekly clinics and 644 at home visits. The number of persons being admitted to hospital shows a decreasing trend, which could be attributed to the follow-up care in the community and the support received. The number of hospitalizations was 65 in 1990 and 41 in 1991.

Regarding the operation of medical clinics, a medical officer visits health clinics in Tortola weekly; clinics are held monthly in Jost Van Dyke and Anegada. There is a resident doctor at Virgin Gorda, where medical clinics are held four times weekly, and once weekly at North Sound. Most persons seen at medical clinics are children and older persons who have been referred by the nurse or who are self-referrals. In 1991, 294 medical sessions were held and 5,642 persons were seen.

Data on hospital services reveal that the total admissions to Peebles Hospital in 1991 was 1,239, representing 8,526 patient days. The overall bed occupancy averaged 47%, with a 60% occupancy rate for the medical unit and 54% for the surgical unit. The overall average length of stay was 6.2 days, although for patients on the medical unit, the average was 10 days, which could be attributed to care of the chronically ill, the mentally ill, and the elderly.

The total number of visits at Peebles Hospital outpatient clinics for 1991 was 11,076, with 3,310 to the casualty department and 6,098 to the emergency room.

There are several technical support services. A small physiotherapy unit is staffed by two physiotherapists. The pharmacy is located in the Peebles Hospital and serves the hospital, health centers/clinics, and the Adina Donovan Home. It is staffed by a senior pharmacist, a pharmacist, and a laboratory/pharmacy trainee. Revenue from prescription drugs is less than 50% of actual cost, since under government policy, certain persons are exempt from paying for drugs. Revenue collected in 1991 for paid prescriptions was US\$ 16,790, and the cost of exempted prescriptions, US\$ 58,289. There also are three private pharmacies.

The laboratory, which is staffed by a laboratory director and four laboratory technicians, provides services to the Peebles Hospital, district clinics, and private physicians. The X-ray department is staffed by a senior radiographer and radiographer.

There are a maintenance supervisor and six officers who perform regular maintenance of mechanical, electrical, plumbing, and other apparatus in health care facilities. Servicing of laboratory equipment has to wait for technicians from Puerto Rico, which results in delays and disruption of services.

Bourganvillea Hospital, the private hospital, has eight beds and mainly offers reconstructive surgery services although some general surgery also is done. The number of admissions in 1991 was 58, and the average length of stay was 3.5 days; the occupancy rate is 32.0%.

Environmental Services

These services come under the responsibility of the Ministry of Health. The environmental health department's main responsibilities include water quality surveillance, institutional hygiene through bacteriological sampling and analysis, inspection and surveys of commercial water treatment and processing plants, periodic chlorine testing of the municipal water supply, institutional sanitation, food sanitation, and vector control.

The municipal water supply is administered by the Water and Sewerage Authorities, which falls under the Ministry of Communication and Works. The department maintains laboratory services and monitors the bacteriological quality of the water it produces. Water samples collected from domestic systems show various levels of contamination from time to time. Samples collected by environmental health officers are analyzed by the water and sewerage technician, but a lack of lab facilities within the Public Health Department makes it difficult to carry out routine water quality surveillance. The Water and Sewerage Authorities also regularly chlorinates the municipal water supply.

The Ministry of Natural Resources' Conservation and Fisheries Department watches over the marine environment. Water in several recreational bays is examined bacteriologically by a technician of the Water and Sewerage Authorities in collaboration with the Conservation and Fisheries Department; high bacterial counts are sometimes reported.

Because there are no requirements for holding tanks, yachts discharge into the ocean. Septic tank effluent

from houses near the shoreline also often is discharged into the sea. Inadequate public health legislation allows raw sewage to be discharged into coastal waters from Roadtown sewerage, hotels, marinas and other tourist facilities, and houses built near the sea.

Groundwater pollution threatens the quality of the water supply. In East End and Long Look septic tanks that are not functioning because of poor construction and the nature of the terrain, cause serious environmental pollution.

Deliberate dumping of used motor oil and animal waste also contributes to the pollution. Leachate from open dumps also is a hazard, but the extent to which groundwater and the marine environment are affected has not yet been determined. The 1991 enactment of the Coast Conservation and Management Act will broaden the legal base for further control.

In 1991, the Environmental Health Department launched a water quality surveillance and institutional hygiene program to monitor water supplies and ensure basic sanitation in public institutions. The program involved the medical certification of water-bottling company employees and others who sell drinking water, as well as periodic sanitary surveys to detect possible sources of public water contamination and the monitoring of the bacteriological quality of water in schools, water companies, the public water supply, hospitals, hotels, and restaurants. In 1991, the survey found that all 29 schools inspected had satisfactory conditions, although one of the five commercial water supplies inspected was found to be deficient.

Currently, groundwater is the main source of water supply, but a program is under way to substantially increase water supply through construction of reverse osmosis desalination plants. Rainwater cisterns are the sole source of water for 80% of the population, but where domestic water storage is prevalent, the risk of dengue transmission goes up. The remainder of the population relies on piped water, but this service, which covers 90% of the urban population, is limited to Roadtown and its environs, Sea Cows Bay. The absence of laboratory facilities precludes water quality surveillance by the public health department.

The Water and Sewerage Authorities are responsible for the public sewerage system, but this system serves only Roadtown and its immediate environs—95.4% of households are served by septic tanks or pit latrines and 4.6% by the public sewerage network. There is concern that sewage does not receive adequate primary or secondary treatment before being discharged into the sea through a 600-foot outfall at Stanley Point. The only treatment is a set chlorination rate regardless

of wastewater flow. Regulations on the size of septic tanks and soak-away system requirements according to the number of users are not enforced.

There are 11 sewage treatment plants attached to hotels and marinas. These are mainly fabricated units, varying in capacity from 1,500 gallons to several thousand gallons. Three of the plants are activated sludge systems and their discharges to the sea are in most cases chlorinated. Some wastewater is recycled for gardening.

To cope with the increasing solid waste management problem, a unit with a manager who is a qualified environmental health officer was established in 1988. Approximately 7,500 tons of solid waste are collected per year in Tortola; in the much smaller island of Virgin Gorda, which has much tourism, approximately 1,500 tons are collected per year.

Collection of all types of solid waste from residential, business, and commercial locations is practiced. Approximately 99% of the population in Tortola is covered by the government service. The material is covered and trucked at high cost to the disposal site on the east of the island at Cox Heath, where it spontaneously burns in the open. A modular incinerator at Packwood Pond began to operate in 1994. Recycling of cans is done by the Conservation and Fisheries Department.

In Virgin Gorda there is a single disposal site where spontaneous open burning of solid waste takes place; in Anegada, a new disposal site is urgently needed; and at Jost Van Dyke, an open dump is used for disposal.

The environmental health division runs a food hygiene program that includes registration and licensing of food establishments, regular inspections, medical examination of food handlers, and weekly educational sessions conducted by environmental health officers: 229 food establishments are registered. All food handlers are required to have a physical examination and laboratory tests, including tests for tuberculosis, VDRL, and stool examinations for ova and parasites, to ensure the absence of communicable diseases. A total of 767 food handlers are registered in Tortola, Jost Van Dyke, and Anegada; Virgin Gorda has 305 registered food handlers.

Food suspected of contamination is sent to the laboratory in Saint Thomas for bacteriological examination. The Department of Agriculture is responsible for the management of the abattoir and meat inspection.

The *Aedes aegypti* control program, which has been in existence since 1973, is the only functioning vector-control program.

An average of four cycles of control activities are completed each year for all premises in the territory. Abate 1% is used in drums and cisterns, and guppies, a well-known predator of mosquito larvae, also are used in drums, cisterns, and wells as part of an integrated control approach. Community education and participation are key elements in this program. The house index, which was higher than 60% in 1973, held at 5.0% in 1992.

Environmental management is a joint effort among several government entities, including town and country planning, water and sewerage authorities, and departments charged with environmental health, conservation and fisheries, agriculture, and solid waste. An intersectoral committee integrates the community-based *Aedes aegypti* program.

The territory has no major manufacturing industries. The most potentially hazardous activities are construction, boating and marinas, agriculture, fiberglass, and the electrical trades. There are no comprehensive regulations governing these worksites.

Health Promotion

Many of the territory's health problems relate to the environment and to lifestyle practices, issues that respond especially well to health promotion. The health education unit has expanded from one health educator in 1988 to one senior health education officer responsible for management, one health education officer, one communications specialist, one audiovisual technician, and two clerical officers.

This division is responsible for the education component of health promotion, and for communication and information; it also provides services to other health department divisions and collaborates with the Department of Education and Culture on school health matters and with the Government Information Service in disseminating information to the public. Priority areas have been identified and health promotion programs were developed for multi-age groups to provide education/information on such issues as heart diseases, AIDS and other sexually transmitted diseases, nutrition, cholera, and environmental health. Multi-media health promotion is targeted to all community groups, but especially to vulnerable groups like adolescents and young adults.

Because it lies within the hurricane belt, the British Virgin Islands has a national emergency organization that coordinates activities related to disaster management. Community awareness and information pro-

grams are used to make people aware of the importance of preparedness. There is an operational hospital response plan in the event of a natural disaster, and key personnel have been trained in emergency procedures. There are basic emergency supplies in each district clinic, and district emergency committees have been set in motion.

Available Resources

Human Resources

Other than local training of nursing assistants, there is no educational institution for training health personnel in the territory. Health personnel are sent to institutions in the United States Virgin Islands, and elsewhere in the Caribbean, the United Kingdom, and the United States of America. Health personnel also participate in ad hoc staff development programs organized locally.

The British Virgin Islands suffers from shortages of skilled nursing personnel, and mainly recruits from other Caribbean countries. In a 1990 review of community nursing services, 67% of registered nurses and 33% of assistant nurses in the community health nursing service came from outside the territory. Foreign nationals are given 2-year contracts and some of them leave at the end of this period, resulting in a rapid turnover of nursing personnel.

In 1992, the territory had 21 doctors (12 in government services, 9 in private practice), 54 registered nurses (40 in hospital, 14 in community health services), 32 nursing assistants (24 in hospital, 8 in community health services), 4 pharmacists (2 public, 2 private), 6 environmental health officers, and 2 solid waste managers. There was one clinical psychologist, one mental health counselor, and two mental health

officers in the mental health services. There were 9 positions filled in health services administration, of which four were in medical records (two trained persons and two assistants).

Financial Resources

Health services are almost entirely financed (95%) from the consolidated fund. In 1990, the budget allocation for community health services (primary health care) was separated from that for hospital services. In 1991, the total recurrent budgetary allocation for health expenditure, excluding funding for capital projects, was 11.3% of the total Government expenditure budget (US\$ 5,715,400 out of US\$ 50,493,000); 54% of the health budget is allocated to hospital services, 27% to community health services (primary health care), and 19% to solid waste management.

A portion of the health expenditures is met through cost recovery mechanisms. Cost recovery sources of revenue from the health sector include inpatient and outpatient hospital fees; dental, X-ray, and laboratory fees; and prescription drug sales. The percentage of the health sector's recurrent expenditure that is met by revenue is approximately 11.8%.

In his 1991 annual report the director of primary health care observes that "although 12% of the total Government budget is allocated to health services, 60% of consultations (up to 95% in some specialties) actually take place in the private sector. At the same time, only a small percentage of fees charged by the Government is actually collected. The only public hospital is underutilized as occupancy levels average about 40%, and this is perhaps because of the virtual absence of private wards and the propensity for residents to seek treatment in the United States Virgin Islands and Puerto Rico."

CANADA

GENERAL HEALTH SITUATION AND TRENDS

Canada is a confederation governed by 1 national, 10 provincial, and 2 territorial governments. It is the largest country in the Western Hemisphere, and it has a land area of 10 million km².

Regarding literacy rates (1988), 62% of the population has sufficient reading skills to function in everyday life; 22% experiences some difficulty; 9% can use printed material for limited purposes; and 7% cannot read. There were just over 10 million occupied private dwellings, of which 63% were owner-occupied. The real per capita gross domestic product increased from Can\$ 19,945 in 1986 to Can\$ 20,555 in 1993. The federal and provincial governments provide a range of health and social programs designed to enable Canadians to fully pursue their economic and social aspirations.

Population

Canada's population in 1991 was 27,296,859, which represented a growth rate of 7.9% since 1986; 5,692,553 (20.8%) were under the age of 15 and 3,169,970 (11.6%) were aged 65 and over. During the 1991 census, 60.5% of the population reported English as their mother tongue and 23.8% reported French as their mother tongue; 13% of the population reported their mother tongue as other than English or French and nearly 3% of the population reported having more than one mother tongue. The 1991 census also revealed that 61.1% of Canada's population lives in metropolitan areas, with 1.5 million more people living in these areas now than in 1986. There are three major metropolitan areas—Toronto, Montreal, and Vancouver—each with a population in excess of 1 million, and having a combined population of 8.6 million, or 31.6% of the country's total population. Six other cities have populations of more than 500,000 and combined populations of over 4 million. The number of live births in 1991 was 402,528, for a rate of 14.4 per 1,000 population. The nat-

ural increase rate observed was 7.7 per 1,000 population in that year (Table 1).

Birth rates for indigenous peoples are higher than the national average. For example, in 1990, the crude birth rate for Inuit in the Northwest Territories was 35.0 per 1,000 population, 2.3 times the national rate of 15.3 per 1,000 population. For status Indians, the crude birth rate was 24.9 per 1,000 population, more than 60% higher than the national rate.

Mortality and Morbidity

Overall mortality rates have declined significantly since the early twentieth century. As Canada moved into public insurance coverage of health care services, specific areas showed further declines.

Between 1976 and 1986, life expectancy at birth for status Indian males increased from 59.8 to 63.8 years, and for status Indian females from 66.3 to 71 years. Life expectancy for Inuit in the Northwest Territories was estimated at 66 years in 1987. For the total Canadian population, life expectancy at birth in 1987 was 73 years for males and 79.7 years for females. In 1990 Canadians had a life expectancy at birth of 73.8 years for males and 80.4 for females.

A major reason for the overall increase in life expectancy at birth is the drop in infant mortality. Infant mortality rates declined about 83% between 1951 and 1991, and reached 6.4 per 1,000 live births by 1991 (see Table 1). This improvement is due to factors such as better health care before and after birth and better nutrition and living standards.

In 1960, infant mortality rates stood at 80 per 1,000 live births for Indians, compared to under 30 per 1,000 for the overall Canadian population. By 1990, the rate was 10.1 per 1,000 for Indians, compared to 6.8 per 1,000 for the overall population; infant mortality rates for the Inuit were 19.2 per 1,000 live births in 1990. The post-neonatal death rate (infants who died between 4 weeks and 1 year old) in Indian communities dropped by almost 50% between 1976 and 1985. In 1976, these communities reported 19.3 deaths per 1,000 infants, compared to 4.3 per 1,000 for the overall population.

TABLE 1
Vital statistics summary, Canada, 1991.

| Item | Number | Rate |
|--------------------------------------|---------|------|
| Live births ^a | 402,528 | 14.9 |
| Deaths ^a | 195,568 | 7.2 |
| Natural increase ^a | 206,960 | 7.7 |
| Infant deaths ^b | 2,571 | 6.4 |
| Neonatal deaths ^b | 1,637 | 4.1 |
| Post-neonatal deaths ^b | 934 | 2.3 |
| Perinatal deaths ^c | 2,757 | 6.8 |
| Maternal deaths ^d | 12 | 0.3 |
| Stillbirths (20+ weeks) ^b | 2,189 | 5.4 |
| Stillbirths (28+ weeks) ^b | 1,397 | 3.5 |

^aRate per 1,000 population.

^bRate per 1,000 live births.

^cRate per 1,000 live births and stillbirths of 28 weeks and more gestation.

^dRate per 10,000 live births.

Source: Statistics Canada.

Data from 1990 placed the Indian post-neonatal death rate at 6.4 per 1,000, compared to 2.7 per 1,000 for the general population.

In 1921, cardiovascular disease and cancer accounted for 26% of deaths; in 1991, this figure had increased to 66%. By the same token, infectious diseases that accounted for 14% of total deaths in 1921, diminished to 1.3% of total deaths by 1991. For example, tuberculosis, which accounted for 7% of deaths in 1921, accounted for 0.1% of deaths in 1991.

An examination of leading causes of death by age group for 1991 shows that for those under age 30, particularly males, motor vehicle accidents are by far the leading cause of death. Males aged 15–19 are more than twice as likely to die in accidents as females, and in the 20–24 age range, their death rate due to motor vehicle accidents is more than fourfold that for females.

The 1990 death rates were almost one-half those of 1969 in all major categories of cardiovascular disease and in rates for both females and males. Among the leading causes of death, malignant neoplasms were the only cause for which death rates increased by about 5% for both males and females, from a total of 51,977 cases in 1989 to a total of 53,963 cases in 1991. Within this category, the female death rate from lung cancer dramatically increased by 16% from 1989 to 1991. As a leading cause of death, circulatory diseases have declined (both for females and males) from 1989 to 1991, from a total of 77,660 to 76,034 cases.

Since 1978, the crude death rate in Indian communities has dropped by more than 40% (deaths by unintentional and intentional injuries have decreased by more than 70%). While in 1978 the age-standardized rate among Indians was 4.6 times greater than the

Canadian rate, by 1990 the Indian rate was only 1.7 times greater. Currently, injury and poisoning are the leading cause of death (more than 30%) among status Indians and Inuit, while they are the fourth leading cause of death for the total Canadian population.

The major current health problems for Canadians, apart from those that result in death, include arthritis and rheumatism; disorders of the back, limbs, and joints; mental disorders; allergies; and dental trouble. The number of hospital separations (discharges, alive and dead) in 1990–1991 were complications of pregnancy, childbirth, and the puerperium at 545,783; diseases of the circulatory system at 434,511; diseases of the digestive system at 411,355; diseases of the respiratory system at 358,471; injury and poisoning at 297,074; diseases of the genitourinary system at 269,571; and neoplasms at 254,969.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Child and Adolescent Health

A vaccine against measles has been used in Canada since the mid-1960s, and since the early 1980s all provinces have stressed measles elimination through immunization and education programs. The rate of reported cases of measles declined sharply in the early 1980s, dropping from 56.4 per 100,000 population in 1980 to 2.4 in 1988. Although the rate increase (42.5) observed in 1989 indicates that some children may have received inadequate protection, the rate again decreased in 1990 (3.9).

As with the adult population, rates of disability among children increase with age. In 1991, the disability rates of children by age groups were: age 0–14, 7.0% with disability; age 0–4, 4.6%; age 5–9, 7.4%; and age 10–14, 9.0%.

Reported disability rates for males were higher than for females, 8.1% compared to 5.7%. Among children with disabilities, a chronic condition (long-term) was reported for more than half (56.2%). Almost 30% of children with disabilities (5 to 14 years old) attended special schools or special classes in regular schools.

Indian children on reserves and Inuit children are considered to be among those most at risk in the country today. More than one-half of them live in low-income circumstances, and the infant mortality rate is nearly twice as high as that of the nonaboriginal population. Indian and Inuit communities also have excep-

tionally high rates of death and illness from unintentional injuries, violence, and suicide. The rate of death due to injuries for status Indian preschool children is six times the national average.

Health of Adults and the Elderly

Below age 45, accidents (including suicide and motor vehicle accidents) were by far the leading cause of death in 1991.

In 1991, suicide was the leading cause of death for males aged 25–44 years and for females aged 30–34 years, although it occurred more frequently among males. In the age group 30–34 years old, the suicide rate was four times higher among males than females. Males in the 20–24 age range had the highest suicide rate, at 31.7 per 1,000 population.

Malignant neoplasms were the leading cause of death among females aged 30 to 44 in 1991. In the age group 45–64 years old, malignant neoplasms were the most frequent cause of death among both males and females in 1991. In the 45–49 age range, the rate of malignant neoplasms for females was slightly higher than for males, and in the 50–64 age range, the rate for males was slightly higher. In the 65–69 age range, malignant neoplasms among males were almost double that of females.

Diseases of the circulatory system were a leading cause of death among males in the 65–85 age range and among females 70 years old and over.

Childbirth, accidents, and diseases of the digestive system are the three main reasons Canadians between 15–44 years old were admitted to hospital in 1990–1991. In the 45–64 age group, the leading cause of hospitalization was diseases of the circulatory system, followed by diseases of the digestive system and malignant neoplasms. Among the elderly, the leading causes of hospitalization were diseases of the circulatory system and malignant neoplasms.

Health of Special Groups

There were 4.2 million Canadians (15.5% of the population) who reported some level of disability in 1991. Of adults aged 35–54, 14% reported some level of disability, as did 46.3% of those aged 65 and older; 32% of those aged 65 and older reported a severe level of disability. Among those 15 to 64 years old who lived in households, mobility disabilities (limited ability to walk, move, or stand) were reported most often, at

5.5%, followed by agility disabilities (limited ability to bend or handle small objects) at 50.2%. The most prevalent disabling conditions for adults were diseases of the musculoskeletal system and connective tissue, arthritis and rheumatism, and hearing disorders.

Aboriginal peoples continue to be one of the country's most socially and economically disadvantaged groups. Inevitably, these inequities are reflected in the groups' overall health status, which has rated poorer than that of the general Canadian population for as long as records have been kept.

Despite ongoing problems, however, over the past 3 decades significant improvements have been made in many aspects of Indian and Inuit health. These advances are due mainly to improved living conditions, better access to good health care, and greater involvement by Indian communities in the health care system.

Diseases and Health Impairments

*Mental disorders*¹ treated in psychiatric hospitals and general hospitals on an inpatient basis were responsible for approximately 11.7 million patient-days in 1989–1990, with psychiatric hospitals accounting for 6.9 million of these patient-days and general hospitals, 4.8 million patient-days. General hospitals are primarily used for short-term intensive treatment, whereas psychiatric hospitals are used for both short-term and long-term treatment.

The number of separations (discharges, alive and dead) for mental disorders was greater in general hospitals than in psychiatric hospitals, even though the number of patient-days was lower in general hospitals. In 1989–1990, general hospitals reported 155,991 cases diagnosed as mentally ill, whereas psychiatric hospitals reported 31,634 cases. In terms of the number of separations, the three most common diagnoses in general hospitals were neurotic disorders, affective psychoses, and alcohol dependence syndrome; in psychiatric hospitals, the three most common diagnoses were personality disorders, schizophrenia, and affective psychoses.

Although aboriginal peoples do not appear to be more prone to psychiatric disorders than the general population, there is evidence of high rates of depres-

¹ The data presented in this section exclude most residential care facilities for mental disorders, namely, treatment centers for emotionally disturbed children, institutions for the mentally retarded, facilities for the mentally handicapped, and alcohol/drug treatment agencies.

sion in this group, including among children. Suicide rates among indigenous peoples are declining, but they remain higher than the rate for the overall population. Rates of alcoholism and other substance abuse also are higher among aboriginal Canadians than among the rest of the population.

Cardiovascular disease (ischemic heart disease and stroke), despite declining rates in recent decades, remains the major cause of death, disability, and illness in the country. In 1990–1991, 39% of deaths in Canada were due to cardiovascular disease. Ischemic heart disease accounted for 23% of deaths, of which more than half are attributable to acute myocardial infarction; stroke accounted for 7% and other cardiovascular disease for 9% of deaths. Stroke is primarily a condition of old age for both sexes, and rates increase dramatically in the older groups (older than age 65). The death rates for males were almost twice those of females in all categories of cardiovascular disease except stroke, for which rates are approximately the same for both sexes. Women over age 75 account for a large proportion of deaths from this condition. Almost 20% of all patient-days in hospital, a total of 8 million in 1990–1991, were for the treatment of cardiovascular disease.

Diseases of the circulatory system, including rheumatic heart disease and hypertension, were the leading causes of death for Indians in the Atlantic region and Quebec between 1980 and 1984, and were second only to injuries and poisoning in other parts of the country. Nevertheless, the Indian death rate from circulatory disease is similar to that of the overall Canadian population. Death rates are decreasing for both aboriginal and nonaboriginal populations, but at a somewhat faster rate for the general population.

Diabetes is one of the most serious chronic diseases among the country's aboriginal populations. In Saskatchewan, Alberta, and British Columbia, non-insulin-dependent diabetes has been identified as the most common chronic condition reported by nurses working on Indian reserves. It is interesting to note that the incidence of diabetes varies among Indian language and cultural groups, suggesting that, in addition to environmental factors, heredity also might be a contributor.

Respiratory diseases are the third largest cause of death for those older than 60, but they are relatively insignificant at younger ages. In 1990–1991, the leading causes of hospital separations were pneumonia (highest number of cases among those aged 75 years and over) and asthma (highest number of cases among those younger than 14 years old). The average hospital stay was 7 to 8 days.

The Indian death rate due to respiratory disease has leveled off over the past decade, after showing a dramatic decrease between 1960 and 1979; nevertheless, Indians are still almost twice as likely as other Canadians to die of respiratory problems. One study of a family medicine practice in southern Ontario found that 45.5% of Indian children had at least one episode of lower respiratory disease in the first year of life, compared to 18% of nonaboriginal children.

The reported number of *tuberculosis* cases decreased by 28% between 1980 and 1987, although the annual number of cases reported for the years 1988 to 1991 has remained stable at approximately 2,000 (7.5 cases per 100,000). Tuberculosis also continues to be a major problem for the Indian population; 20% of the new cases of tuberculosis reported in 1990 were in aboriginal peoples.

Accidents and violence (accidental injuries, motor vehicle accidents, and suicide) resulted in 13,232 deaths (9,146 males and 4,086 females) in 1991. In 1989–1990, there were 299,833 separations from hospital, (168,157 males and 131,676 females); the length of stay was higher for females (13 days) than for males (9 days). The total number of patient-days has decreased slightly since 1982.

The rate of death due to unintentional injuries in First Nations communities has dropped by more than 70% since 1979. The 1990 age-standardized rate of death from accidents and violence for Indians is 81 per 100,000 population, compared to 46 per 100,000 population for the overall population. The high death rate for Indians aged 15 to 44 years is largely attributable to injuries involving motor vehicles (with alcohol as a major contributing factor), drowning, fires, and firearms. For Inuit, the leading causes of such deaths are firearms, followed by drowning. Many aboriginal communities also have faced a high incidence of suicide among teenagers and young adults. The 1990 age-standardized suicide rate for Indians was 22 per 100,000 population, compared to 11 per 100,000 population for the country as a whole.

Alcohol-related problems also rank as significant causes of death. In 1989, 3,062 deaths were classified as directly attributable to alcohol, and another 15,960 deaths from cancer, heart disease, respiratory problems, accidents, suicide, and homicide involved alcohol as a contributory cause.

In 1991, three times more men aged 55–59 years died of chronic liver disease and cirrhosis than women. In older age groups, the death rate was twice as high for men as for women. In 1987–1988, there were 36,872 cases with primary alcohol-related diagnoses treated

as inpatients in general hospitals for alcoholic psychoses (5,283), alcohol dependence syndrome (16,183), non-dependent use of alcohol (3,111), alcoholic polyneuropathy (70), alcoholic cardiomyopathy (244), alcoholic gastritis (2,183), chronic liver disease and cirrhosis (8,639), portal hypertension (144), toxic effect of alcohol (979), excessive blood alcohol level (2), alcoholic pellagra (3), suspected damage to the fetus from maternal alcohol addiction, listeriosis, or toxoplasmosis (11), and noxious influences transmitted via breast milk or placenta (20). Studies show that there are probably another 30,000 inpatients with secondary alcohol-related diagnosis in Canada.

According to the National Alcohol and Other Drugs Survey conducted in March 1989, 22% of those who had 15 drinks or more in the week before the survey reported a problem with their health during the previous year; a comparable proportion among persons who did not consume alcohol that week was 5%.

Rates of alcoholism and other substance abuse also are higher among aboriginals than among other Canadians.

Cancer, the leading cause of death in Canada, accounted for 53,963 deaths in 1991. Between 1981 and 1989, mortality increased by 0.6% among men and 0.5% among women. Over the past 20 years, incidence and mortality rates have increased steadily for prostate cancer, lung cancer among women, and melanoma and kidney cancer for both sexes.

In 1992, it was estimated that 115,000 new cases of cancer were diagnosed, with the number of new cases increasing by about 3,000 per year. The estimated number of cancer deaths was 58,300. In 1992, lung cancer was the most common cancer among men, being responsible for an estimated 21% of all new cancer cases and an estimated 33% of all cancer deaths. The other leading cancers among men include prostate cancer, colorectal cancer, lymphomas, and bladder cancer. In 1992, among Canadian women, breast cancer was the most common cancer, accounting for an estimated 28% of cancer cases and an estimated 20% of cancer deaths. The other major cancers among women include colorectal cancer, lung cancer, cancer of the uterus, and lymphomas. Incidence and mortality rates for breast cancer appear to have increased modestly during the late 1980s. Breast cancer remains the leading cause of cancer deaths for Canadian women, particularly in British Columbia.

Over 254,900 cancer patients were separated from hospital in 1990–1991. Lung cancer and female breast cancer accounted for the greatest number of separa-

tions. Prostate cancer was the third-ranking cause of hospitalization, at a rate of 132 per 100,000 males.

Geographic analyses of incidence show higher rates in Quebec for cancers of the tongue, mouth, pharynx, lung, and bladder (likely related to the higher levels of tobacco use in that province); a relatively high rate of stomach cancer in Newfoundland (consistent with the high use of salted and smoked foods); and higher rates of melanoma of the skin in Ontario and British Columbia (possibly related to variations in exposure to sunlight).

Cancer rates among Indians have remained fairly steady over the past 10 years, at a time when the incidence of cancer in the general population has increased. Between 1978 and 1988, the cancer rate among Indians remained below the national average and almost all age and sex groups faced a reduced cancer risk compared to the population at large (although lung, cervical, and breast cancer rates continue to be a major problem for aboriginal women). Inuit, on the other hand, have a higher cancer mortality rate than the general Canadian population.

Regarding *sexually transmitted diseases*, the rate of reported cases of gonococcal infections continues to decline, from 160.6 cases per 100,000 in 1985 to 25.3 per 100,000 in 1991. The rate for cases of early symptomatic syphilis approximates those reported in the late 1980s.

Since the early 1980s public health officials have become increasingly concerned about the incidence of *acquired immunodeficiency syndrome* (AIDS). In Canada, most persons with AIDS (more than 90%) have been exposed to the human immunodeficiency virus (HIV) through sexual contact with infected individuals; the remainder have been infected from using contaminated needles while injecting drugs, and through blood products or blood transfusions from donors infected with the virus. Since the first diagnosed AIDS case in Canada in 1979, the total number of cases has risen to 7,770 as of April 1993. The number of persons known to have died, as of April 1993, is 5,128 (66%).

Risk Factors

Health Canada programs protect and improve Canadians' well-being by defining, advising, and managing risks to human health. These programs require cooperation with provincial health authorities, health professionals and their associations, academia, and international health agencies.

The responsibilities of the Health Protection Branch of Health Canada involve assessment and control of

food safety, quality, and nutrition; safety and effectiveness of drugs and medical devices; identification and assessment of environmental hazards; and identification and investigation of human disease and injury.

In 1992, staff from the Health Protection Branch conducted 2,900 inspections of food, drugs, and medical device manufacturing facilities. They also responded to more than 3,300 consumer complaints and reviewed 1,000 new medical devices for health and safety risks prior to marketing. Staff helped to investigate 14 major disease outbreaks and other localized outbreaks; it also monitored radiation exposure for 113,000 Canadian workers dealing with radioactive substances.

Laboratory staff analyzed some 72,200 illicit drug samples to support criminal proceedings by police; evaluated more than 1,800 food additives, packaging materials, and agricultural chemicals; and conducted at least one new health hazard assessment of food contaminants each day.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Characteristics of the Health Care System

Canada has a taxpayer-financed, comprehensive health insurance system that covers medically necessary hospital and physicians' services for all residents. All Canadians, regardless of their ability to pay, have access to health care. What has come to be known as Medicare in the country, really constitutes 12 interlocking health plans administered by the provinces and territories, which have constitutional authority for health care. Medicare's two major components, the Hospital Insurance Program and the Medical Care Program, began 10 years apart. First, the Hospital Insurance and Diagnostic Services Act of 1957 led to all provinces/territories providing their residents with comprehensive coverage for in-hospital care by 1961. Then, in 1968, came the federal Medical Care Act, and by 1972, all provincial/territorial health care plans insured doctors' services. The 1983-1984 Canada Health Act consolidated the previous legislation on hospital and medical care insurance and clarified the broad national standards that provincial plans must meet in order to qualify for federal funding. The federal criteria consist of reasonable access to insured services without impediment by way of user charges and additional billing; comprehensive coverage of insured services; universality of population covered; portability of benefits; and public administration on a nonprofit basis.

Organization of Services

In Canada, most doctors are in private practice and are paid on a fee-for-service basis under a fee schedule negotiated between the provincial association and the provincial government.

Canada's health care system relies extensively on primary care physicians (i.e., family physicians, general practitioners, internists, and obstetrician-gynecologists) for providing medical care and making referrals to specialists. Primary care physicians account for about 63% of all active physicians in Canada; about 8 out of 10 primary care physicians in Canada are family physicians and general practitioners.

When Canadians need medical care, they go to the doctor or clinic of their choice and present the health insurance card issued to all residents of a province. Doctors bill the province; patients do not pay directly for medical services and are not required to fill out forms for insured services. There are no deductibles, copayments, or dollar limits on coverage.

About 95% of Canadian hospitals are nonprofit and are operated by voluntary organizations, municipalities, or other agencies. Hospital boards and administrators have control of the day-to-day allocation of resources provided that they stay within the operating budgets they have negotiated with the province. They are primarily accountable to the communities they serve, not to the provincial bureaucracy.

Some drugs, dental care, and eyeglasses are covered by supplementary benefits programs or are paid out-of-pocket. All pharmaceuticals provided in hospital are covered by the national health insurance program. Under provincial laws, private insurers are restricted from offering coverage that duplicates that of governmental programs, but they may compete in the supplementary benefits market.

Provincial, regional, and municipal health authorities also manage primary health services such as safe water provision and sewage treatment; operate public health programs such as communicable disease surveillance and control and health education; provide inspection of food-service establishments; and offer home and hospital services to mothers and newborns and school health services such as immunization clinics and preventive care dental clinics. In many instances, rehabilitation and home care services also are provided by the health authorities and by voluntary agencies.

At the federal level, the Department of Health is the principal agency concerned with health matters; it encourages innovative approaches to health care with a focus on prevention. It also provides occupational

health, environmental health, and emergency health services within its areas of jurisdiction, and funds applied research including health services research. (The Medical Research Council primarily funds biomedical research.) The Department is responsible for regulatory functions to safeguard the quality and safety of foods, cosmetics, pesticides, drinking water, and air quality, as well as the safety and effectiveness of drugs and medical devices. The Federal Government also provides health services directly to registered Indians and to the military. The Department also is responsible for monitoring disease incidence, assessing risks, providing disease control services, providing national epidemiologic and laboratory surveillance of HIV/AIDS, and identifying and assessing environmental hazards. The Action Plan on Health and the Environment, developed in order to better understand the link between health and the environment, concentrates on a number of key areas, including establishing and strengthening standards for water, air, soil, and food and protecting Canadians who are more at risk because of age or unique diet.

Because federal, provincial, and territorial governments share responsibility for health, a structure that allows for consultation and collaboration among them has been established, and is comprised of the following: the Conference of Ministers of Health, the Conference of Deputy Ministers of Health, and several federal-provincial advisory committees, as well as subcommittees and ad hoc working groups established to deal with subjects requiring more detailed study.

Funding of the Health Care System

In 1991, Canada spent an estimated US\$ 56,900 million on health care, representing 9.9% of the gross domestic product.

Public expenditures account for about 72% of total health care spending in the country.

Spending on health accounts for up to one-third of provincial budgets. Most of the funds for the provincial plans come from general revenues, which may be supplemented by sales taxes, payroll taxes levied on employers, or premiums paid by individuals. Only Alberta and British Columbia now collect premiums, but premiums are not rated by risk in either province and prior payment of a premium is not a precondition for treatment.

The federal contribution for insured health services is based on a per capita entitlement that is adjusted according to changes in the Gross National Product (GNP) and is calculated independently of provincial

costs. Federal fiscal restraint measures have frozen per capita entitlements at 1989–1990 levels for a 5-year period, and all major federal transfers to the provinces are under review. The federal contribution is financed through consolidated revenues (personal and corporate income taxes, excise taxes, import duties, etc.).

The provinces have considerable autonomy in managing health care spending. A hospital's operating costs must be paid out of the annual budget it negotiates with the provincial ministry of health. In most cases, proposals for the expansion of programs, services, and health facilities must be approved by community and provincial authorities. Responsibility for funding capital expenditures is shared among the public, voluntary, and private sectors.

Compensation for physician services is negotiated between the provinces and the provincial medical associations on the basis of fee and utilization increases, and it is subject to individual physician or general ceilings. The provincial medical associations usually decide how an increase in payments for doctors' services will be divided among the medical specialties. Salaries for nurses' services are generally negotiated through collective bargaining between the union and the employers.

Although Canada's health insurance system is efficient, it faces rapidly escalating costs as a result of an aging population, expensive new technology, and rising consumer expectations. The federal and provincial governments are responding to the need to contain costs in several ways: by shifting the focus from physician and hospital-based care; expanding disease prevention and health promotion activities; and making better use of professionals such as nurses, therapists, and dietitians. Table 2 provides a breakdown of health expenditures by category, expressed as percentages of total health expenditures.

Delivery of Health Services

The provinces and territories have developed several strategies to provide services to all Canadians, including persons living in remote areas. These strategies include flying ambulances and health teams, community health aide training programs, and accident prevention and health education programs. Outreach services, organized under provincial coordination, are integrated with networks of basic and specialized medical and hospital services. Smaller hospitals typically provide core hospital services, and secondary and tertiary referral hospitals, which are usually located in the larger

TABLE 2
Percentage distribution of health expenditures by category, Canada,
1980 and 1988 to 1991.

| Category | 1980 | 1988 ^a | 1989 ^a | 1990 ^a | 1991 ^a |
|--|----------|-------------------|-------------------|-------------------|-------------------|
| Institutional and related services | | | | | |
| Hospitals | 40.9 | 39.1 | 39.1 | 39.4 | 39.1 |
| Other institutions | 11.6 | 10.2 | 9.8 | 9.8 | 10.0 |
| Other | 1.2 | N/A ^b | N/A ^b | N/A ^b | N/A ^b |
| Professional services | | | | | |
| Physicians | 15.2 | 15.6 | 15.2 | 15.0 | 15.2 |
| Dentists | 5.8 | 5.4 | 5.4 | 5.5 | N/A ^c |
| Other professionals | 1.2 | 1.4 | 1.4 | 1.4 | 6.9 |
| Drugs and appliances | | | | | |
| Drugs | 8.9 | 12.7 | 13.1 | 13.3 | 13.8 |
| Other | 1.8 | 1.2 | 1.3 | 1.4 | N/A ^b |
| Other health expenses | | | | | |
| Capital expenditures | 5.4 | 4.3 | 4.3 | 4.1 | 3.6 |
| Other | 7.9 | 10.2 | 10.4 | 10.1 | 11.4 |
| Total health expenditures ^d | 22,704.0 | 52,933.0 | 57,793.0 | 62,706.0 | 66,771.0 |

^aFigures for these years are estimates.

^bUnavailable data have been included in "Other health expenses, other."

^cUnavailable data have been included in "Professional services, other professionals."

^dTotal health expenditures are expressed in millions of Canadian dollars.

population centers, provide a wider range of specialized and intensive services. Health professionals similarly provide primary health care services in Canadian communities, with additional health specialties made available through regional referral plans coordinated by the provinces and territories.

Medical care insurance plans in the 10 provinces made fee-for-service payments for 182.4 million visit services (office, hospital, and home) in 1990–1991, for a rate of just under 6.9 services per insured person. In addition, they paid for 2.1 million major and 2.8 million minor surgical procedures. Of an additional 152.9 million services, 112.6 million involved radiology and laboratory services. Obstetrical services for 1990–1991 amounted to 694,793. The above total of 340.2 million services does not include out-of-province payments made by provincial medical care insurance plans, services provided to residents of the two northern territories, and millions of services provided by physicians under other arrangements, such as services for which payments were made on a salary or other non-fee basis, services that were the responsibility of Workers' Compensation Boards, uninsured services, and services provided to uninsured persons.

Dental Services. Canadians spent about Can\$ 3,100 million on dental care in 1989, representing 5.4% of total health expenditures. Dental insurance has grown significantly since 1970.

Hospital Services. Patients spent 41.4 million days in acute care and in convalescent and chronic hospitals in the 1989–1990 fiscal year, but the number of patient-days in these hospitals per 1,000 population varied by age and sex. For the age group in the childbearing years (15–44 years old), there were 890 patient-days per 1,000 women, while the rate for men was 480. In the age group 45–64 years old, both men and women had a high rate of days of hospital care, at 7,510 and 7,720 per 1,000, respectively. The average length of stay in hospital also varied by sex and age. In the age groups 25–34 and 35–44 years old, the average length of stay for men in 1989–1990 was 8.1 days for both groups and for women 5.1 and 7.3 days. Average length of stay for men aged 45–64 was 10.8 and for women, 11.2. In the age group 65 years old and older, men averaged 15.1 days and women 16.1 days. In addition, there were 6.9 days of care in psychiatric hospitals in 1989–1990.

Installed Capacity

As of 1 April 1992, the country had 1,211 hospitals with 165,904 beds, including general and specialty public hospitals (hospitals not operated for profit and financed by the provincial/territorial governments). That figure includes hospitals owned and operated by lay or religious organizations, municipalities, and provincial governments), proprietary hospitals

TABLE 3
Number of operating hospitals and their approved bed complement,
by type of hospital, Canada, 1 April 1992.

| Type of hospital | Number | Beds |
|--|--------|---------|
| TOTAL, ALL HOSPITALS | 1,211 | 165,907 |
| Public, total | 1,048 | 159,694 |
| Public, General | 833 | 122,450 |
| Non-teaching—Total | 774 | 85,573 |
| Non-teaching with no long-term units | 451 | 28,389 |
| 1–24 beds | 172 | 2,526 |
| 25–49 beds | 130 | 4,156 |
| 50–99 beds | 71 | 4,802 |
| 100–199 beds | 43 | 6,091 |
| 200–299 beds | 20 | 4,854 |
| 300 and more beds | 15 | 5,960 |
| Non-teaching with long-term units | 323 | 57,184 |
| 1–49 beds | 69 | 2,244 |
| 50–99 beds | 77 | 5,481 |
| 100–199 beds | 67 | 9,256 |
| 200–299 beds | 43 | 10,580 |
| 300 and more beds | 67 | 29,623 |
| Teaching (excluding pediatric) | 59 | 36,877 |
| Public, Specialty | 35 | 4,941 |
| Pediatric | 8 | 2,187 |
| Psychiatric (including alcohol-drug) | 14 | 1,481 |
| Other ^a | 13 | 1,273 |
| Rehabilitation (including convalescence) | 20 | 2,587 |
| Extended care (including chronic) | 89 | 17,547 |
| Psychiatric long term | 21 | 12,018 |
| Nursing station, outpost | 50 | 151 |
| Proprietary, total | 58 | 3,611 |
| General | 3 | 234 |
| Rehabilitation extended care | 46 | 2,899 |
| Psychiatric | 4 | 347 |
| Other | 5 | 131 |
| Federal, total | 105 | 2,599 |
| General ^b | 16 | 1,828 |
| Psychiatric | 3 | 342 |
| Nursing station, outpost and other | 86 | 429 |

^aIncludes specialties, e.g., oncology, cardiac, neurological, orthopedic, and respiratory diseases.

^bIncludes one extended care hospital in Quebec.

Source: *List of Canadian Hospitals, 1991*, Canadian Centre for Health Information, Statistics Canada.

(owned and operated by an individual or a private organization for profit), and federal hospitals. (Table 3 shows the breakdown for these institutions.)

Research and Technology

Basic, applied biomedical research and applied health research, including research on the development of Canada's health care system, is conducted by

the federal and provincial governments, by non-governmental organizations, and by the private sector. University research mainly involves investigations into the biochemical and physiological bases of health and disease, whereas scientific research conducted in hospitals concentrates on the investigation of disease and disabilities and of treatment development and testing. New pharmaceuticals, medical devices, and technologies are generally developed by the private sector. The Canadian Coordinating Office for Health

Technology Assessment was recently established as an information clearinghouse to make existing information on technology assessment available to others.

Human Resources

The number of practicing civilian physicians, including interns and residents, increased at a rate far exceeding population growth—there was an increase of almost 55% in the number of physicians, while the population grew 19% from 1975 to 1991. Table 4 shows the number of active physicians and the population per physician in 1975 and in 1991. Canadians today confront the problem of physician distribution, both geographically and functionally. In collaboration with the Federal Government and professional associations, many provinces have established incentive programs to encourage physicians to remain in non-urban regions, such as supporting undergraduate and post-graduate students with guaranteed incomes and providing location grants and on-the-job training in rural areas.

The number of practicing dentists has increased at an even greater rate than that of physicians. In 1975, Canada had 8,738 dentists (1 for each 2,619 persons), and by 1991, the figure had reached 14,621 (1 for each 1,863 persons). In 1991, there were 262,288 registered nurses in Canada, with 230,940 of them employed in nursing. The number of licensed pharmacists in 1990 was established at 22,121, which represents 1 pharmacist per 1,213 people.

The federal/provincial advisory committee on health personnel provides an ongoing flow of information on the number of types of health specialists in the country.

Health Promotion

In the 1990s, the health care system continues to focus on disease prevention, health promotion, and community-based care. Since the beginning of the 1980s, virtually all new federal health initiatives have been directed toward health promotion and prevention within the broader framework of health as a social phenomenon. Others dealt with reducing tobacco use, combating substance abuse, creating and maintaining healthy environments, strengthening community services, and preventing the spread of AIDS. In addition, much effort has been directed to improving the overall socioeconomic status of specific target groups, includ-

TABLE 4
Number of active physicians and population per physician, Canada, 1975 and 1991.

| Type of physician | 1975 | 1991 |
|---|--------|--------|
| All physicians | 39,104 | 60,559 |
| General practitioners and family physicians | 16,379 | 27,929 |
| Specialists | 16,182 | 24,934 |
| Interns and residents | 6,543 | 7,696 |
| Persons per physician | 580 | 450 |

Source: Health Information Division, Policy and Consultation Branch, Health Canada.

ing Native Canadians, disabled persons, children, and seniors.

The Department's Health Promotion Directorate's strategic approach to health promotion incorporates five key activities: policy development, research and knowledge development, funding, social marketing/education/communications, and partnerships. Policy development is accomplished through consultation, coordination, and consensus-building with partners, key influencers, and opinion leaders. These activities have resulted in the 1986 Ottawa Charter, Canada's strategy document "Achieving Health for All," the Directional Paper for the National Strategy to Reduce Tobacco Use, and the Victoria Heart Health Declaration. The Department supports and conducts research, evaluation, and information dissemination activities designed to generate an understanding of health determinants and the effectiveness of health methods and programs, including the National Alcohol and Drugs Survey, Canada's Health Promotion Survey, and Canada's participation in the WHO Cross-National Youth Survey on Health Behaviors in School-aged Children. In the 1992–1993 fiscal year, the Department funded Can\$ 15.6 million to support 862 projects encouraging national organizations and community groups to become involved in health promotion. Some of the specific issues involved were AIDS, Canada's Drug Strategy, Brighter Futures (child and family health), and Healthy Environments. The Department also made available Can\$ 3 million to create six Health Promotion Centers for Excellence at universities across Canada to foster working partnerships among communities, researchers, health care providers, and groups such as schools, businesses, and farming communities whose traditional areas of concern lie outside health promotion. Integrated social marketing/education/communications programs designed to promote individual and social change also have been very suc-

cessful. "Ready or Not," an education program that helps parents help their children make informed choices about drug use and abuse, has been implemented in six provinces, and "Quit for Life," a smoking cessation guide kit for teens, was produced and distributed by a national pharmaceutical company. Posters were distributed to schools by the Lung Association and television music programming helped promote the kit; as of mid-June 1993, 11,000 kits had been distributed through the pharmaceutical company. The new "Canada's Food Guide to Healthy Eating," a result of consumer research and consultation with health professionals, universities, voluntary organizations,

industry, and various levels of government, for the first time includes an "other foods" category to help consumers balance "snack foods" with more nutritious choices.

Health departments at all levels rely heavily on voluntary agencies. The annual worth of voluntary work to the health and social sectors is estimated at approximately Can\$ 4,000 million. In 1991-1992, National Health and Welfare provided grants in the amount of Can\$ 2.7 million to more than 46 voluntary organizations to help with their operations. In 1992-1993, the Health Promotion Fund provided Can\$ 15 million to some 454 community-based projects.

CAYMAN ISLANDS

GENERAL HEALTH SITUATION AND TRENDS

The Cayman Islands is a British Dependent Territory comprising three islands totaling about 250 km². Grand Cayman is the largest island and site of the capital city, George Town; the other islands are Cayman Brac and Little Cayman. It lies in the western Caribbean, about 240 km south of Cuba and 290 km west of Jamaica. In 1991, the population was estimated at 26,150.

The territory is governed by a Governor, who represents the United Kingdom, an executive council, and a legislative assembly. The economy is based upon thriving and growing international banking, insurance, and tourism industries. The exchange rate is CA\$ 1.2 per US\$ 1. Inflation averages between 7% and 8%. The 1990 GDP was CA\$ 596 million, an increase of 20% over the previous year, when it was CA\$ 498 million. In 1987, the per capita GDP was US\$ 15,860; in 1990, the per capita GDP was US\$ 26,200.

Health and Living Conditions

In 1991, the median household income was CA\$ 39,500 (\$41,800 for non-Caymanians; \$37,500 for Caymanians): 12% of households had an income of less than \$10,000, while 19% reported an income of \$70,000 or more. According to the 1989 census, there were 8,115 households, and the average number of persons per household was 3.1.

The literacy rate exceeds 98%. In 1989, unemployment was estimated at 6.2%; a labor force survey in late 1991 found unemployment at 5.9%. In 1991, 4,726 students were enrolled in 19 schools, and were taught by 356 teachers, giving a student to teacher ratio of 13.3. Six of the 19 schools were private, and the remaining, public.

Population

The 1989 census estimated the population at 25,322, and 2 years later, the labor force survey estimated it at

26,150. By mid-1991 the population had been estimated at 26,500. In terms of place of residence, 96% of Caymanians live on Grand Cayman, with more than one-half living in George Town. (Little Cayman has a population of 33 people.) In 1991, 67% of the population was Caymanian, 33% non-Caymanian.

Table 1 shows the distribution of the population by age and sex according to the 1989 census, showing that 22.7% of the total population was under 15 years old and 6.3% was 65 years old or older. In the age group under 15 years old, there were more males than females, but in all older age groups, women surpassed men. In comparison, the figures of the 1979 census, which involved a much smaller population (16,677), put the age group under 15 years old at 29.1% of the total population, and the age group 65 years old and older at 7.0%.

The population growth rate was 4.9% in 1989, 3.4% in 1990, and 3.2% in 1991; immigration plays an important role in population growth. Prior to 1970, population growth was typically less than 2% per year, jumping to 5.8% in the 1970s, and then declining to 3.4% during the 1980s.

The birth rate per 1,000 population averaged 18.5 per year in the 1989–1991 3-year period (for a total number of 1,429 live births in the period). The average yearly death rate in the same period was 4.3 per 1,000 population (for a total number of 334 deaths).

During the 1980s, births in the territory averaged 372 per year, never exceeding 440, while in 1990, births increased to 490, hitting a record high of 500 births in 1991. But while the numbers have increased, the birth rate has held at between 16 and 20 per 1,000 population; official estimates suggest that another 10% to 20% of births take place overseas. Typically, fewer than 120 deaths are recorded each year; since 1987, the death rate has averaged 4.5 per 1,000 population per year.

The total fertility rate averaged 3.4 children per woman in 1985–1990. It was 3.9 in 1990 and 3.8 in 1991, based on 1989 census percentages.

Life expectancy at birth was 77.1 years in 1989, which was an increase from the 1983 estimate of 74.5 years.

TABLE 1
Population by age and sex, Cayman Islands, October
1989 census.

| Age group | Total | | Male | | Female | |
|--------------|--------|-------|--------|------|--------|------|
| | No. | % | No. | % | No. | % |
| All ages | 25,355 | 100.0 | 12,372 | 48.8 | 12,983 | 51.2 |
| Under 15 | 5,758 | 22.7 | 2,900 | 11.4 | 2,858 | 11.3 |
| 15-24 | 4,327 | 17.1 | 2,124 | 8.4 | 2,203 | 8.7 |
| 25-44 | 9,652 | 38.1 | 4,679 | 18.5 | 4,973 | 19.6 |
| 45-64 | 4,017 | 15.8 | 2,003 | 7.9 | 2,014 | 7.9 |
| 65 and older | 1,601 | 6.3 | 666 | 2.6 | 935 | 3.7 |

Source: Government of the Cayman Islands. Cayman Islands Population and Vital Statistics, 1991.

Mortality

In 1991, there were 7 infant deaths per 500 live births, resulting in an infant mortality rate of 14 per 1,000. All infant deaths occurred in the neonatal period, giving an identical neonatal mortality rate of 14 per 1,000 live births.

The average annual infant mortality rate for 1989-1992 was 9.3 per 1,000 live births. The neonatal mortality rate for the period was 8.3 per 1,000 live births. Sixteen of 18 (90%) infant deaths in 1989-1992 occurred in the neonatal period. The average yearly stillbirth rate for this period was 10.3 per 1,000 total births (live plus stillbirths). In the 1989-1992 period, the main causes of death during the neonatal period were congenital anomalies (ICD-9, 740-759) and certain conditions originating in the perinatal period (760-779).

Between 1989 and 1991, there was only one death in the age group 1-4 years old. There were 43 deaths in the age group 0-14 years old in the 8-year period between 1984 and 1991, one of which was attributed to ill-defined causes. Certain conditions originating in the perinatal period ranked as the leading group of causes of death, with 14 deaths (33% of deaths from defined causes in this age group), followed by congenital anomalies, with 8 deaths (19%); motor vehicle traffic accidents (E810-E819) ranked third, with 6 deaths (14%), and accidental drowning and submersion (E910) ranked fourth, with 5 deaths (12%). As a group, external causes of injury and poisoning were responsible for 12 deaths (29%) in this age group. Together, these top four groups of causes were responsible for 77% of all deaths (including those from ill-defined causes) in this age group during 1984-1991.

In the age group 15 years old and older, the major causes of mortality for 1984-1991 were diseases of the circulatory system (390-459) (especially acute myocar-

dial infarction and cerebrovascular disease), malignant neoplasms (140-239) (especially cancers of the lung and the female breast), and all accidents and adverse effects (especially motor vehicle traffic accidents).

Of 856 deaths during 1984-1991 in the age group 15 years old and older, 22 were attributed to ill-defined causes. Of the deaths from defined causes, 371 (44.5%) were due to diseases of the circulatory system, and malignant neoplasms ranked second, with 171 deaths (20.5%). External causes of injury and poisoning ranked third, with 85 deaths (10.2%). Together, these top three groups of causes covered 75.2% of all deaths from defined causes in this age group during 1984-1991.

There is a lack of readily available data on morbidity in all age groups, but the morbidity and mortality due to traffic accidents remain areas of special concern, as do problems related to alcohol and drug abuse and sexually transmitted diseases.

During 1984-1991, there were a total of 899 deaths, of which 23 were assigned to symptoms, signs, and ill-defined conditions. Important contributors to overall mortality from defined causes (876 total deaths) were: acute myocardial infarction (102 deaths, 11.6% of mortality from defined causes); cerebrovascular disease (100 deaths, 11.4%); motor vehicle traffic accidents (56 deaths, 6.4%); pneumonia (41 deaths, 4.7%); malignant neoplasms of trachea, bronchus, and lung (30 deaths, 3.4%); malignant neoplasms of female breast (27 deaths, 3.1%); and diabetes mellitus (26 deaths, 3.0%).

Mortality classified as resulting from external causes was proportionally lower in the 1984-1991 period (9.7% of total mortality from defined causes, or 85 of 876 deaths) than in the 1980-1983 period (16.5% of defined mortality, or 67 of 404 deaths). Mortality from diseases of the circulatory system had around the same proportion in 1984-1991 (42.3%, or 371 of 876 deaths) as in 1980-1983 (43.1%, or 174 of 404 deaths). Mortality due to malignant neoplasms had a higher proportion of total deaths in 1984-1991 (19.6%, or 172 of 876 deaths) than did the proportion assigned to the slightly broader category "neoplasms" in 1980-1983 (13.6%, or 55 of 404 deaths).

SPECIFIC HEALTH PROBLEMS

Analysis by Population Groups

Perinatal and Child Health

Low birthweight prevalence increased from 7% in 1989 to 10% in 1990 and 1991. The average percentage

of low birthweight for the 1989–1991 period was 9.4%.

Vaccination coverage rates for children under 1 year old for the third dose of oral polio vaccine were 93% in 1989, 99% in 1990, 96% in 1991, and 97% in 1992. For the third dose of DPT, the coverage rates for 1989–1992 were almost the same as those for oral polio vaccine, and for MMR, the figures were 89%, 89%, 90%, and 99%, respectively. BCG coverage rates were clearly lower—81%, 81%, 80%, and 80%, respectively for 1989–1992.

From 1978 through 1991 there were no reported cases of diphtheria. Although there have been sporadic cases of measles reported in the 1980s, the last major epidemic of the disease was in 1979 (274 reported cases). From 1983 through 1989, measles cases were reported each year—nine, five, four, two, three, one, and five, respectively. In 1992, there were four cases of measles.

In 1991, there were three reported cases of mumps and five in 1992. In 1991 and 1992, there were no cases of other diseases preventable by immunization, including acute flaccid paralysis.

Two cases of tetanus were reported during the 1980s, one in 1983 and one in 1988. Since then, no cases were reported up to 1992. Data on the age of these patients are not readily available.

Whooping cough was reported in 1983 (six cases) and in 1984 (four cases). Since then, no cases had been reported up to 1992.

Adolescent and Adult Health

Although there are no readily available morbidity data, it can be deduced from the mortality data that diseases of the circulatory system, diseases of the respiratory system, and accidents are significant causes of morbidity for this group.

There was a 20% decline in the number of traffic accidents (859 to 693) and a 75% decrease in traffic deaths (from 20 to 4) between 1990 and 1991. Casualties also declined, by 28% (from 357 in 1990 to 258 in 1991). The number of pedestrians involved in accidents was 21 in 1990 and 24 in 1991. Although road traffic accidents declined somewhat, incidents reported by fire-fighting services increased. All incidents reported by fire-fighting services from 1989 to 1991 totaled 362, 256, and 557, respectively; most of these incidents were domestic (334, 229, and 420 for 1989, 1990, and 1991, respectively).

A marked increase in drug offenses brought before the courts has been noted, accounting for 27.5% of reported crimes in 1991. Overall crime also has in-

creased, particularly in incidents related to drug offenses.

Data from the Cayman Counseling Center for drug users show that most new drug users coming to the institution during 1989–1992 were in the age group 20–29 years old (40%; 142 new users of a total of 359), followed by the age group 30–39 (33%; 118 new users). Adolescents (persons under 20) represented 8% (30) of the new clients coming in during the given period. The male to female ratio was 3.3:1. Alcohol addiction was the most prevalent problem, followed by problems with marijuana and problems with cocaine.

Public concern over the prevalence of heart disease and the apparent increase in levels of alcohol and drug abuse have resulted in the formation of groups and plans to undertake educational, preventive, and treatment programs.

Health of Women

Mortality statistics on women for 1989–1991 show that ischemic heart disease and breast cancer are major causes of death. No records are available on morbidity.

There were 160 deaths of women in the 1989–1991 period, of which 4 were attributed to ill-defined causes. Of the 156 deaths from defined causes, 63 (40.4%) were attributed to diseases of the circulatory system; malignant neoplasms were the assigned cause in 32 cases (20.5%); and external causes were reported in 11 deaths of females (7.0%) during the period.

Some of the most prevalent diagnoses of causes of female mortality in 1989–1991 were ischemic heart disease (33 deaths), cerebrovascular diseases (15 deaths), breast cancer (14), pneumonia (10), and diabetes mellitus (7).

Teenage pregnancy (under 20 years old) ranged between 15% and 20% during the 1989–1991 period, with an average yearly rate of 17.6% over the period. In 1991, of the 76 births to teens, 62 were first babies; 13, second babies; and 1, third baby.

Health of the Elderly

During 1984–1991, 558 of 899 total deaths (62.1%) occurred in the age group 65 years old and older. Of these deaths, 83 (14.9%) were attributed to cerebrovascular disease, 65 (11.6%) to acute myocardial infarction, 37 (6.6%) to pneumonia, 23 (4.1%) to diabetes mellitus, and 16 (2.9%) to lung cancer. No data is available on morbidity.

Health of Special Groups

In the past few years, Cuban refugees have come to the Cayman Islands shores. In 1992 there were more than 100 refugees including children, although currently there are only about 40. Refugees are given full medical examinations and blood tests on arrival and are looked after by public health nurses and a doctor.

Diseases and Health Impairments

There were four cases of imported *malaria* in both 1991 and 1992. There were no recorded cases of *dengue* or *yellow fever*. In 1991, a total of 229 cases of *influenza* were reported; in 1992 the number was 52.

No cases of *cholera* were reported. There were 37 reported cases of *gastroenteritis* in the age group under 5 years old in 1992, compared to only 4 in 1991.

Three cases of *ciguatera poisoning* were reported in 1992 (none in 1991), and 66 and 79 cases of food borne diseases in 1991 and 1992, respectively.

Three cases of *tuberculosis* were reported in both 1991 and 1992. No cases of *leprosy* were reported.

Between 1985 and March 1993, 31 persons have tested positive for *HIV infection*; 5 have left the Cayman Islands and 15 have developed full blown AIDS, 12 of whom have died. The male to female ratio among the 31 HIV-positive persons was 1.6:1. Heterosexual transmission was the major route of infection, with 20 (64%) cases assigned to this category.

In 1992 there were 143 cases of syphilis and 164 cases of gonorrhoea. In 1991 the number of syphilis cases was 205.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

On 1 January 1992 Parliament established a Health Services Authority as a semi-public institution charged with the day-to-day management of the health services. This development was the direct result of a 1989 review of the health services' management and delivery.

Other components of the government policy include an expansion of the inpatient capacity of the government hospital, development of secondary and tertiary care medical specialty capability, development of coordinated and integrated ambulatory care services, development of a formalized (international) referral sys-

tem, redefinition of the public health services, development of district clinics into comprehensive health centers, and integration of public and private sector providers.

Organization of Services

Personal Health Care Services

Overall, there are about 2.4 hospital beds per 1,000 population. Grand Cayman Hospital currently provides 45 acute care beds, and seven beds each in the nursery and intensive care units. Cayman Brac Hospital maintains 12 general care beds. In 1991, Grand Cayman Hospital recorded 3,365 discharges and Cayman Brac Hospital, 331, for a rate of 141.3 per 1,000 population. Average length of stay data are not available.

The Government also operates a seven bed extended care unit for patients transferred from Grand Cayman Hospital acute care beds who require long-term nursing care.

There are six government health centers or clinics which provide all maternal and child health services, health education, routine nursing care, and home visits.

There is a substantial school dental program that provides preventive dental services through five auxiliaries working from five fixed and one mobile clinic.

Health Promotion

Several public and private initiatives have been set in motion to address various health issues. For example, the Cayman Counseling Center offers a substance addiction treatment program that includes individual counseling, an outpatient primary treatment program, a family program, a group therapy program, preventive education peer counseling, a prison program, and an adult child of dysfunctional families program.

In addition, the center, working with Cayman Against Substance Abuse, has launched prevention education programs such as a parent-to-parent program, a youth-to-youth program (a peer counseling program), and a partner-to-partner program (a 10-week marriage enrichment program). In May 1992, an employee assistance program was initiated.

The Cayman Islands Health Promotion Council sponsors "Heartbeat Cayman," an activity that aims at reducing morbidity and mortality from heart disease by promoting healthy lifestyles, and which includes a component that encourages the responsible use of alcohol and the reduction and prevention of alcohol abuse.

TABLE 2
Government expenditure on health (millions CA\$),
Cayman Islands, 1989–1992.

| Type of expenditure ^a | 1989 | 1990 | 1991 | 1992 ^c |
|--|------|------|-------|-------------------|
| All current expenditure | 76.0 | 94.2 | 103.0 | 111.8 |
| Current expenditure, health ^b | 10.5 | 14.6 | 14.6 | 6.0 |
| All capital expenditure | 14.9 | 16.1 | 16.5 | 13.6 |
| Capital expenditure, health ^b | 0.6 | 1.2 | 2.1 | 0.1 |

^aThe definition of expenditure follows International Monetary Fund conventions.

^bHealth excludes Health Authority Board from 1992.

^cApproved budget estimates.

Source: Government of Cayman Islands. *Cayman Island Compendium of Statistics*, 1991.

Other routine health promotion projects include annual health week activities, featuring hypertension screening, annual colon cancer screening, and diabetes and AIDS and other STDs screening and awareness activities.

“Tobacco Day” activities have been very successful in achieving the smoking ban on flights into the Cayman Islands and in banning smoking in several public places such as stores and restaurants.

Environmental Services

Responsibility for such activities as water quality surveillance, meat and food inspection, monitoring of food handling establishments, oversight of solid waste management, and review of building plans rests with the Environmental Health Section.

Routine meat and food inspections resulted in low levels of condemnations and disposal. In terms of water inspection, 23% of cistern and 45% of well water samples produced levels of fecal coliform contamination that required further investigation and treatment. All samples from desalinization plants, the major water production facilities, continue to be satisfactory.

There are two piped water supply systems in Grand Cayman, both fed by desalinated water, which provide water to approximately 2,500 connections, representing about 50% of the island’s population and all its major hotels.

Apart from these systems, rainwater is typically collected from roofs and stored in cisterns, or water is pumped from groundwater sources for drinking and domestic use. Private water truckers transport water

from the Water Authority Works to supplement individual rain- and groundwater supplies.

Cayman Brac and Little Cayman have no public water supply, so residents must rely on rainwater catchment and yard wells. Hotels on these islands operate small reverse osmosis plants, and the Water Authority has several public hand pumps tapped into a small groundwater reservoir. All 8,115 households on the Cayman Islands have access to some form of water supply.

In 1991, solid waste collection continued to be carried out with a minimum collection rate of 3 days per week on Grand Cayman. A private engineering firm completed a 20-year solid waste management plan, and additional sanitary landfill sites were identified and site preparation has begun.

The main tourist hotel area of George Town is served by a central sewerage treatment plant. The initial plan to reuse the treated effluent for irrigation has temporarily been put on hold because of high salinity, which is a result of the fact that several hotels use saltwater to flush toilets. One proposal suggests that the treated effluent itself might be used in place of seawater.

All other sewage treatment and disposal is carried out on a site-by-site basis, utilizing septic tanks with deep well injection or soakaway fields. Larger apartment and office buildings and hotels outside the public sewerage system’s service area operate private package treatment plants. There is evidence that the on-site treatment and disposal of sewage represents a threat to groundwater supplies, as is reflected by the relatively high levels of fecal coliform noted during routine water quality monitoring.

According to 1989 census figures, most Cayman Islands households (96.9%) were connected to a sewage system (either mains, septic tanks, or cesspools).

Available Resources

In 1991, there were 23 doctors in the government health service, and another 21 in full-time private general or specialist practice; this translated to 1.7 doctors per 1,000 population. Rates for dentists were 3.6 and for nurses and midwives, 4.8.

In 1991, health and social services accounted for 16.9% of total government recurrent expenditures (1990, 16.8%), or almost CA\$ 673 per capita. Household expenditure on medical and health care was 3.2% of total household expenditure (\$12,646/\$390,890). Table 2 gives an overview of government expenditures on health.

CHILE

GENERAL HEALTH SITUATION AND TRENDS

Population

According to its latest census, conducted in 1992, Chile had a population of 13,231,803. The country's overall increase between 1982 and 1992 was 16.8%. The average annual population growth during 1985–1990 was 1.7%, and it is estimated that this figure will be slightly lower, 1.55%, for 1990–1995. The slowdown in the growth rate is due mainly to lower fertility (which follows a decline in mortality) coupled with low immigration. In the last 30 years, the birth rate has declined by 40%, and in 1991 it stood at 22.4 live births per 1,000 population. The expected number of live births per woman fell from 5.3 during 1960–1964 to 2.6 during 1985–1989.

The general mortality rate, which was 5.6 per 1,000 population in 1991, remained basically unchanged during the 1985–1989 period.

Half the country's population is concentrated in two of the country's 13 political and administrative regions—Valparaíso and metropolitan Santiago—which represent only 4% of the national territory. The density is lowest in the extreme north and south of the country. Except for Libertador O'Higgins and Aisén, all the regions south of Valparaíso had slower growth rates during 1980–1990 than the national average (1.5 per year), and they are experiencing a process of outmigration.

Fertility varied significantly from one region to another. The highest total fertility rates were seen in the southern regions, except in Magallanes—which surprisingly had a rate of 2.39 births per woman, a level only slightly lower than that of metropolitan Santiago (2.4)—Valparaíso, and Libertador O'Higgins, which had the lowest of all.

In 1990, 85% of the population lived in urban areas, with regional differences ranging from a high of 99% in Antofagasta to 59% in Araucanía. In metropolitan Santiago, 97% of the population is urban.

Currently, the average male to female ratio for the country as a whole is 96.6 males to 100 females, a figure

that is somewhat skewed by the metropolitan Santiago and Valparaíso regions, which have very high concentrations of female population. According to estimates by the National Statistical Institute, the 1989 ratio in rural areas was 118.8 males to 100 females, compared with 94.2 to 100 in urban areas.

The proportion of persons 65 years of age and older is estimated at 6.1%, although the age distribution varies considerably from region to region. The regions south of Bío-bío (except Magallanes) have the highest proportion of population under the age of 15, reaching levels of over 31%, whereas the central regions have under 30%. Those in the extreme north and south have the smallest proportion of older adults—lower than the national average of 6.1%—whereas Valparaíso has the highest, with an elderly population of 7.1%, closely followed by Araucanía. The latter also has the highest proportion of children, reflecting a heavy outmigration of young adults.

Health and Living Conditions

The figures used to analyze living conditions come from the National Socioeconomic Characterization Surveys (CASEN) conducted by the University of Chile under contract with the Ministry of Planning. The first two surveys were conducted in 1985 and 1987, respectively, and the latest one, CASEN-90, was carried out in November 1990.

According to the data from CASEN-90, 5.2 million people, or 40% of the country's inhabitants, are considered to be below the poverty line, and 1.8 million, or 13.8% of the total population, live in extreme poverty or indigence. The 1.8 million represent 370,000 households with an average of 4.8 members each, compared with 4.1 per household for the country as a whole, 4.7 among all the poor, and 3.7 among the non-poor. The extremely low per capita income of the indigent population (Ch\$ 5,323) represents less than one-eighth the national average and less than one-tenth the average for the non-poor.

The region with the largest proportion of extreme poverty is Araucanía, where 21.1 of the population is

classified as indigent, and it is closely followed by Bío-bío and Maule. The regions that have the lowest proportions of indigent population are Tarapacá in the far north and Aisén and Magallanes in the south.

In 1982, the country as a whole had 2,457,000 households and a population of 11.05 million, for an average of 4.5 persons per household; 5 years later CASEN-87 estimated that the average number of household members had declined to 4.3. In 1990, the number of households was 3,179,000 and the national population was 12.8 million, for a household average of 4.1–4.04 in urban areas and 4.12 in rural areas. Metropolitan Santiago weighs heavily in these national averages. In 7 of the 13 regions, the households are larger in urban areas than they are in the countryside.

Employment

The economically active population (EAP) increased from 4.55 million in 1988 to 4.72 million in 1990. In this latter year, 51% of persons 15 years of age or older were part of the EAP. According to CASEN-90, 73.8% of the male population was working, as were 32.4% of all females. Unemployment declined from 12% in 1985 to 5% in 1990 and 4.8% in 1991, but it remains an acute problem in the population aged 15 to 24, for whom the rate was 11.6% in 1991.

The service sector accounts for the most employment, followed by agriculture and fisheries. Commerce ranks third. Industry, the most dynamic activity in terms of both productive transformation and creation of new jobs, is in fourth place.

Housing

The 1992 census recorded 3,260,674 dwellings in the country (3,247,484 single-family homes and 13,190 multi-family residences), representing an increase of 26% since the 1982 census. This percentage exceeded the population growth rate during the same period, which was 16.8%.

Education

According to the 1982 census, 91.2% of the population 15 years of age and older was literate. Basic education is compulsory for children aged 6 to 14, and 96% of this age group is covered. Nearly two-thirds of the population aged 15 to 18 receives secondary educa-

tion. The country has 21 universities and 23 other institutions of higher learning, in which 246,875 students were enrolled in 1991 (54.9% males and 45.1% females). Tuition is charged for higher education and it is, therefore, not within the reach of the economically less favored groups.

In 1991 there was a total of 3.24 million students enrolled in schools at all levels, of which 1.66 million were males and 1.58 million were females. The sex distribution shifts after basic education, with a larger number of females than males at the secondary level.

Mortality

General Mortality

Over the 1980–1991 period general mortality fell from 6.6 to 5.6 per 1,000 population, but not all population groups shared in this decline. It was greatest among women and the group aged 0–4 years. In general there is not much difference between urban and rural mortality, although the rate for men is higher in rural areas and for women it is higher in the cities.

By region, the general mortality rates for 1990 ranged from a high of 7.1 per 1,000 in Araucanía to a low of 4.2 per 1,000 in Tarapacá. The adjusted rates show a narrower range, and they confirm that general mortality is higher in the southern regions (except Magallanes) and lower in the greater northern regions. In that same year, the highest adjusted rates were registered in Bío-bío (6.9 per 1,000), Maule (6.8 per 1,000), and Araucanía (6.7 per 1,000)—which are also the regions in which living conditions are the worst. The lowest adjusted rates were in Tarapacá (5.0 per 1,000), Magallanes (5.2 per 1,000), and metropolitan Santiago (5.4 per 1,000)—the regions in which living conditions are the best.

A correlation can be seen between general mortality and living conditions: in the communes with a population of more than 5,000, the general mortality rates for both sexes increase in tandem with the proportion of population living in a state of poverty. The figures for women are especially telling.

Age-specific Mortality

Between 1980 and 1990, age-specific mortality declined in all age groups. The most significant decrease was among children under age 5, who accounted for 12.7% of all deaths in 1980 but only for 7.4% in 1990.

There was only a slight decline in mortality in the population aged 55 and older, although the relative contribution of older adults to general mortality increased from 63.3% to 71.48%.

Life expectancy at birth in 1992 was 75.6 years for women and 68.5 years for men.

As did the general mortality rates, the age-specific rates mirror the percentage of population living in a state of poverty in the country's 335 communes: in those communities with a population of more than 5,000, the increase in mortality is directly proportional to the increase in poverty.

Sex Distribution of Mortality

Mortality is higher among men at all social levels and in all age groups. In 1990, general mortality was 6.4 per 1,000 in men and 5.1 per 1,000 in women. The decline in mortality between 1980 and 1990 was greater among women, for whom it dropped by 57%, than among men, who had a decrease of 46.1%.

Mortality by Causes

The quality of information on mortality by causes is considered to be satisfactory. In 1990, 94.8% of all deaths were medically certified and only 6.2% were assigned poorly defined diagnoses.

The leading causes of death in Chile are diseases of the circulatory system, which taken together account for 58% of all deaths. The risk of dying from the three leading causes—diseases of the circulatory system, malignant neoplasms, and accidents and violence—remained about the same throughout the last decade, at levels of around 300 per 100,000. Mortality from diseases of the respiratory system was higher whenever there were epidemics. In 1990, a sharp increase in deaths from this group of diseases made it the third leading cause, shifting injuries and violence to fourth place. Mortality from diseases of the digestive system has fluctuated in tandem with deaths from cirrhosis, a disease that in Chile accounts for 60% of the deaths from diseases of the digestive system. Mortality from infectious diseases and perinatal complications has declined over time, as have the rates for metabolic, endocrine, and nutritional disorders, the principal component of which is diabetes mellitus (75%).

Mortality from diseases of the circulatory system was 164 per 100,000 population in 1990; within this group of causes, 36% corresponded to ischemic heart

disease, 32.5% to cerebrovascular diseases, and 12.7% to diseases of pulmonary circulation. Mortality from cardiovascular diseases was higher in the communes that had less than 10% of their populations living in poverty and in those with a proportion between 10% and 20%, while it was consistently lower in the communes that were poorer. At all levels of poverty, mortality from this group of causes was higher among males.

Almost half the mortality from malignant neoplasms (49.5%)—for which the rate was 109 per 100,000 in 1991—corresponded to the digestive organs and the peritoneum, especially the stomach, bladder, and colon; 17.7%, the genitourinary organs; and 11.4%, the respiratory organs. Mortality from cancer is greater among women at all poverty levels, except in those communes that had less than 10% of their populations living in poverty.

Pneumonias continue to account for most of the deaths from diseases of the respiratory system (62.5%). In 1990, these diseases ranked third among the leading causes of death, with a rate of 73 per 100,000 population.

Injuries, accidents, and violence have become increasingly serious problems and now rank high among the causes of death and hospitalization. This category was responsible for 85% of the deaths in the population under 65 years of age, while 16.5% of the deaths from accidents and violence occur in persons under the age of 15. For more than 10 years, accidents have been the leading cause of violent deaths, and more than one-third of these are traffic accidents.

Infectious and parasitic diseases rank seventh among the leading causes of death. In 1990, they were responsible for 2,475 deaths (3.2% of the country's total), and the principal diseases were tuberculosis (29%), septicemia (38.5%), and intestinal infections (21%). Mortality increased with the rising percentage of poverty.

Conditions originating in the perinatal period were responsible for 2.2% of all deaths. Within this group, the principal causes were respiratory difficulties and diseases of the fetus and newborn (38.2%), disorders relating to short gestation and low birthweight (26.9%), intrauterine hypoxia and birth asphyxia (15.9%), and perinatal infections (9.9%).

Finally, diseases of the genitourinary system were responsible for 2.0% of deaths. Among these, the most important were nephritis and nephrosis, which accounted for 40% of the deaths in this group of causes.

Although congenital anomalies did not rank among the 10 leading causes of death, they were responsible

for 1.4% of all deaths and 22.9% of the deaths in children.

Morbidity

Household surveys of representative population samples give information on the frequency of illness as perceived by the population. It is estimated that at any given moment 25% of all families have a member who suffers from an acute disease, 3.1% of them have a member who has had an injury, and 39.5% of them have a member with a chronic disease. The chronic diseases most often reported by the population are cardiovascular diseases, especially arterial hypertension; rheumatic diseases, particularly back problems and joint disease; diabetes mellitus; chronic bronchitis; mental disorders, especially neuroses; peptic ulcer; and epilepsy.

Although the disease reporting system has shortcomings, it does provide some useful information, especially regarding communicable diseases and diseases that are the subject of specific control programs. In 1990, a total of 228,052 cases were reported. The most frequent diseases were influenza (836.7 per 100,000 population), chickenpox (265.7 per 100,000), and mumps (113 per 100,000).

The first case of cholera was reported in 1991, and the measures taken to control the epidemic also have significantly lowered morbidity from enteric diseases associated with poor sanitation: between 1989 and 1992, morbidity from hepatitis dropped from 80.9 to 38.8 per 100,000 population, and the rate for typhoid fever fell from 50.7 to 13.8 per 100,000.

Complications of pregnancy, delivery, and the puerperium are responsible for 29.3% of all hospitalizations. This figure includes 173,129 normal deliveries (12.4% of all discharges) and also cases under the heading "other reasons for contacting the health services," including routine examinations or checkups, which represent 3.6% of all discharges. Even excluding these causes, complications of pregnancy, delivery, and the puerperium continue to be the most frequent causes for hospitalization, representing a total of 237,248 discharges (21.3% of the total). Two out of every 10 cases involve abortion, and the rest correspond to direct obstetric causes such as hemorrhage, toxemia, and complications of the puerperium.

Diseases of the digestive system ranked second among the causes for hospitalization (13.8% of all discharges). Thirty-four percent of the patients had cholelithiasis or cholecystitis; 18%, hernias; 16%, ap-

pendicitis; 5%, ulcers; and 4%, cirrhosis. Diseases of the respiratory system were the third leading cause for hospitalization (12.1% of all discharges): 43% of the cases were pneumonia, 14% were chronic bronchitis, and 13% were acute bronchitis and bronchiolitis. The cause "injuries, poisonings, burns, and violence" ranked fourth among the causes for hospitalization (12% of the discharges).

Diseases of the genitourinary system ranked fifth among the causes for hospitalization (8% of the discharges). Of this group, 44% were diseases of female genital organs, 35% were diseases of the urinary system, and 21%, diseases of male genital organs. In sixth place (6%) were diseases of the circulatory system, of which 24% were diseases of the heart and pulmonary circulation, 21% were cerebrovascular diseases, 16% were ischemic heart disease, and 12% corresponded to hypertensive disease. Neoplasms came in seventh place, accounting for 5.8% of the discharges; of these, 54% were malignant and 46% were benign or of unspecified nature. The main sites of malignant neoplasms were the uterus (11.7%), breast (9.8%), stomach (9.8%), trachea, bronchia, and lung (5.0%), gallbladder and bile ducts (4.5%), and prostate (4.5%). In eighth place, representing 5.4% of the discharges, were infectious and parasitic diseases, including intestinal infections, which accounted for 60% of the cases. Ranking ninth were conditions of the perinatal period, which represented 4.8% of the discharges and were responsible for 42% of all problems in infants under 1 year of age. Finally, diseases of the nervous system and sensory organs were in 10th place (3.3% of the discharges). The other causes affected less than 3% of the patients hospitalized.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

Infant mortality fell from 31.8 per 1,000 live births in 1980 to 14.6 per 1,000 in 1991—a 154% reduction. In 1975, infant deaths represented more than one-third of all deaths, and by 1990 only 5.9%. In 1991, neonatal mortality was 7.9 per 1,000 live births, accounting for 54.1% of all deaths in infants under 1 year old.

The reduction in infant mortality is the result of several factors: the sharp decline in birth rates in recent years and the high levels of institutional prenatal-control coverage, professional delivery care, programs

for monitoring child growth and development, vaccination campaigns, and supplementary feeding initiatives. Ten percent of the decrease in infant mortality may be attributed to improvements in basic sanitation and its effect on infant diarrhea. Since the 1970s the steady decline in infant mortality has occurred independently of the country's changing economic conditions.

There are regional differences in the infant mortality rates, which range from a low of 11.3 per 1,000 in Tarapacá to a high of 20.9 per 1,000 in Araucanía.

Mortality in children 1 to 4 years of age declined 38.4% during 1980–1991, ending in a rate of 69.4 per 100,000 population in 1991. This improvement mirrors the expansion of primary health care coverage in both urban and rural areas, as well as that of the Expanded Program on Immunization (EPI), with a consequent decrease in morbidity and mortality from infectious diseases preventable by immunization, especially mortality from diarrhea and infectious respiratory diseases.

The percentage of low birthweight dropped from 6.6% in 1987 to 5.6% in 1991.

Respiratory diseases were the leading cause of hospitalization among children up to 9 years of age, and within this group, the discharge rate was 2,700 per 100,000 for children aged 1–4. The rate for injuries, poisoning, and violence was 904 per 100,000 discharges in children 1–4 years old.

In the population under 15 years of age, 57% of the outpatient consultations were for acute respiratory diseases, 18% for infectious and parasitic diseases, and 9% for diseases of the skin. Among children enrolled in kindergartens run by the National Board of Scholarship and Fellowship Assistance, there were 11 acute episodes per 100 child/months of observation in 1990, of which 57% corresponded to respiratory diseases, 13.9% to skin diseases, and 10.5% to diarrhea.

Health of Adolescents and Adults

Adolescents experienced an average of 0.79 episodes of acute disease per year, with a consultation rate at the primary care level of 0.15 per year. The most frequent causes fell under the heading of "ill-defined," followed by acute respiratory diseases. The distribution of referrals to the secondary level of care was as follows: psychiatry, 40%; ophthalmology, 18%; dermatology, 11%; and traumatology, 5%.

Several studies have provided information on the frequency of alcoholism and drug addiction in adolescents. In 1985, among children living in extreme poverty in the Santiago area commune of San Miguel, it was

found that 22% had consumed alcohol and 11% had been intoxicated at some time. Various studies about drug addiction set the proportion of those who have experimented with marijuana at 4% to 14%, and of those who have inhaled volatile substances, at 3.1% to 6.4%.

Mortality in males between the ages of 45 and 64 declined from a rate of approximately 1,400 per 100,000 in 1980 to 1,300 per 100,000 in 1990. Mortality from infectious diseases decreased in both sexes. The rates for malignant neoplasms, diseases of the circulatory system, and external causes remained stable in men, and the rates for diseases of the circulatory system declined among women.

Smoking prevalence in the general population ranged between 36% and 45%. The rate has fallen slightly among men (from 47% to 44%), whereas it has increased among women (from 36% to 41%). This addiction correlates directly with family income—the higher the income, the higher the prevalence—and with years of schooling.

It is estimated that there are 450,000 alcoholics in Chile, plus another 1.8 million persons who drink to excess. During the 1984–1990 period the number who consumed alcohol in some form among the population 15 to 24 years of age doubled.

Health of Women

The three leading causes of death in women are malignant neoplasms (96.5 per 100,000), heart disease (91.5 per 100,000), and cerebrovascular diseases (53.2 per 100,000). Maternal deaths are the fourth cause. Accidents rank fifth for women, compared with second for men. Suicide and homicide rates are very low for women (1 and 0.5 per 100,000, respectively), and these problems are found mainly in women under 45 years old.

In Chile, women have had access to birth control services since the 1960s, which has not only helped to lower the birth rate beginning in the 1970s, but also has had an impact on maternal mortality. In the last 20 years the number of women giving birth to more than three children has declined, and the spacing between pregnancies has increased. A significant percentage of births take place in the low-risk population, and in 1991 the proportion of professionally attended deliveries reached a high of 99.2%.

In 1991 maternal mortality stood at 3.5 per 10,000 live births, down from 7.3 per 10,000 in 1980 and 16.8 per 10,000 in 1970. Mortality associated with abortion also has fallen sharply—from 39 per 100,000 live births

in 1977 to 9.4 per 100,000 in 1990. Additional causes of maternal mortality include those under the miscellaneous heading of "other complications of delivery and the puerperium," with a rate of 13.7 per 100,000, and toxemia, at 7.8 per 100,000.

The rise in the rate of mortality from malignant neoplasms in women is due to an increase in cancer of the gallbladder and bile ducts, whose rate has slowly risen since 1980, reaching a level of approximately 13 per 100,000 women by 1990. Mortality from breast cancer was 16.8 per 100,000 in 1985 and declined to 12.3 per 100,000 in 1990. For cancer of the cervix uteri, mortality fell from 17.9 per 100,000 in 1985 to 11.8 per 100,000 in 1990.

About two-thirds of all hospitalized patients are women. In 1990, a total of 898,414 women were treated in the country's hospitals; the hospitalization rate for the general population was 6.8% and for the female population, 13.5%. In 1990, the hospitalization rate for complications of pregnancy, delivery, and the puerperium was 3.1% for the entire population and 11.6% for women between the ages of 15 and 49 years.

Health of the Elderly

In 1990, mortality in the group aged 65 and over was 43.9 per 1,000, or 7.3 times higher than in the general population. Deaths in persons 65 and over represented 65.4% of all deaths in the country. Diseases of the circulatory system and malignant neoplasms represented 56% of the deaths in the elderly population. These causes were followed by respiratory diseases, representing 14%, and then digestive diseases, at 6%. In 1989, the rate of hospital discharges in this age group was 128.6 per 1,000, and the average stay was 11.8 days. The leading cause of hospitalization was diseases of the circulatory system, followed in order by diseases of the digestive system, diseases of the genitourinary system, and malignant neoplasms.

According to the CASEN-90 survey, 75% of the population older than 65 years is covered by the public health system; 11% obtains care in the private sector; 5% is covered under private health insurance institutions (the ISAPRE programs); and 4% uses health services provided by the armed forces.

Workers' Health

It is estimated that at least 40% of the active labor force is not insured against work-related health prob-

lems. Consequently, the data available on occupational diseases and accidents in the workplace do not give a very accurate picture of the health problems that workers face in Chile.

There is reason to believe that the data on occupational diseases on file with the National Health Services System (SNSS) suffer from significant underregistration. The cases most frequently reported are conditions of the skin, ears, eyes, and musculoskeletal system, in that order. Bronchopneumopathies, which ranked second in 1975, had fallen to fifth place by 1989. Work-related accidents increased from 72,600 in 1982 to 224,400 in 1989, and the rate was six times greater among workers in associations covered by the SNSS—probably because of underregistration elsewhere.

In 1989, the accident rate for the country's workers was 12%. Of those who suffered accidents, 19,500 had to be hospitalized, for an average stay of 7.8 days per patient. In recent years, the average number of days lost per accident has remained constant at 12.5.

Diseases and Health Impairments

Vector-borne Diseases

The presence of *Triatoma infestans* in Chile exposes about 500,000 persons living in 60 communes to Chagas' disease. According to serological studies, 19% of the population is infected. In endemic areas, serological screening is done by 57 hospital-based blood banks, which cover 75.7% of the country's donors.

Mortality from hydatidosis increased from 0.5 per 100,000 population in 1981 to 3 per 100,000 in 1986 and has since then stabilized at this level. The morbidity rate went from 2.1 to 2.8 per 100,000 population during the 1985–1990 period. The prevalence of hydatidosis in abattoirs remained stable at around 10% of all animals slaughtered.

No cases of malaria or yellow fever have been reported since 1945. The last case of rabies was diagnosed in 1972.

Vaccine-preventable Diseases

Between 1980 and 1990 there was a progressive decline in the rates of diseases preventable by vaccination (diphtheria, whooping cough, and tetanus) and, to a lesser extent, those associated with poor sanitation (typhoid and paratyphoid fever and hepatitis). In 1990, the incidence of diphtheria was 0.3 per 100,000, having

experienced a slow but steady decline despite periodic variations. In 1989, there were 47 cases, and in 1990, 36. In the last 4 years, there have been fewer than five deaths annually from this cause, and in 1990 there were none.

The incidence of whooping cough has varied considerably in recent years: 46 cases and 3 deaths were reported in 1987; in the next year the numbers jumped to 224 cases and 9 deaths; in 1989 there were 202 cases and 2 deaths; and in 1990 the level was down again, at 59 cases and 2 deaths.

Measles follows epidemic cycles that tend to repeat every 4 years. The last outbreak was in 1988, with 45,079 reported cases and a morbidity rate of 351 per 100,000 population. In 1989, there were 13,008 cases, and in 1990, 1,958 cases, with no deaths. A nationwide vaccination campaign was conducted during the second quarter of 1990, and an active epidemiologic surveillance system was implemented. There have been no reported cases of poliomyelitis since 1976.

Cholera and Other Intestinal Infectious Diseases

Chile's first cholera case was reported in Santiago's metropolitan region in April 1991. In April and May of that year there were 41 confirmed cases reported from six different regions, and the case-fatality rate was 4.8%. Most of the cases (33) were in metropolitan Santiago. Although no cases were reported between June and December, environmental samples continued to be positive for *Vibrio cholerae* 01 Inaba. The main sources of transmission in 1991 were leafy green vegetables—those that grow close to the soil and are eaten raw. In 1992, there were 73 confirmed cases (in Arica, Iquique, and Melipilla). In 1992, the first cases appeared earlier than they did in 1991 and the outbreak started in the north of the country. Of the total cases, 11% were imported and six were in children under the age of 10. There also was an institutional outbreak among workers in a private clinic in Santiago, which was traced to a contaminated food supply. The mode of transmission that year was mainly via the consumption of raw shellfish. During 1993, a total of 28 cases were reported, 22 (78.6%) of which were in the northern part of the country. Of the 28 cases, three (10.7%) were imported.

The incidence of typhoid fever fell by more than 50% between 1980 and 1990, ending at a level of 39.3 cases per 100,000 population with a registered mortality rate of 0.22 per 100,000. The trend followed two patterns during the period: between 1980 and 1983, the rate rose

from 97.6 to 119.8 per 100,000; after 1983 it began to decline steadily, and 1991 marked the beginning of an even more spectacular drop. Thanks to the environmental control and other measures introduced to combat cholera, especially those aimed at discouraging the consumption of leafy green vegetables, incidence of the disease fell from 31.6 per 100,000 population in 1991 to 13.8 per 100,000 in 1992, the lowest recorded level in the country's history.

Hepatitis is the sanitation-related disease most frequently reported in Chile. Between 1980 and 1984, the rate increased from 36.7 to 107.6 per 100,000 population, after which it went to 66.5 per 100,000 in 1990, 66.6 in 1991, and 38.8 in 1992.

Chronic Communicable Diseases

Mortality from tuberculosis in 1991 was 3.5 per 100,000 population, or less than one-third as high as it had been in 1980 (12.2 per 100,000). The morbidity rate also declined, going from 55.0 per 100,000 in 1985 to 41.1 per 100,000 in 1991. In 1991, a total of 6,636 tuberculosis patients were hospitalized, and their average age was 42.5; 81% of these cases were pulmonary tuberculosis.

Respiratory Diseases

In 1990, respiratory diseases were the third leading cause of death in the general population, and in children under 1 year old they ranked third after conditions of the perinatal period and congenital anomalies. Pneumonias are responsible for a major share of the deaths in this age group, with a mortality rate of 2.3 per 1,000 live births in 1990. Bronchopneumonias accounted for 60% of all hospitalizations in children under 1 year old and 46% in the 1-to-4 age group. More than 50% of pediatric consultations in the primary care and children's emergency services were for respiratory diseases.

AIDS and Other Sexually Transmitted Diseases

Cases of acquired immunodeficiency syndrome (AIDS) in Chile were first observed in males in 1984 and in females in 1985. As of December 1992, a total of 694 cases had been reported—646 in males and 48 in females, for a sex ratio of 13:1; 340 of the patients had died. In addition, there were 1,082 HIV-infected indi-

viduals—948 of them males and 134 females. The principal route of transmission is sexual contact, which accounts for 86% to 90% of the cases, and the predominant form of contact is homosexual and bisexual. The average age of persons with AIDS is 34.4 years, and of HIV-infected persons, 30.2 years. The regions most affected are metropolitan Santiago (with a cumulative rate of 10.9 per 100,000), Valparaíso (8.3), and Antofagasta (4.3). Twenty-two cases have been reported among health workers—all of them men and all from the metropolitan Santiago or Valparaíso regions. The prevalence of HIV among blood donors increased from 0.1 per 1,000 in the first half of 1988 to 0.25 per 1,000 in the second half of 1992.

In 1990, gonorrhea headed the list of notifiable sexually transmitted diseases and accounted for 56.2% of cases, followed by syphilis, at 33.5%, and then nongonococcal urethritis, at 7.5%. Syphilis has been steadily declining: 4,282 cases were registered in 1990, representing an incidence of 32.5 per 100,000 population. Nevertheless, among the sexually transmitted diseases it continues to predominate. Gonorrhea, too, has been declining significantly, from 104 per 100,000 population in 1987 to 55.2 in 1990.

Nutritional and Metabolic Diseases and Deficiencies

From 1980 to 1992, the prevalence of malnutrition in children under the age of 6 declined from 11.5% to 6.3%, while that of severe malnutrition went from 0.2% to 0.0%. Undoubtedly, the reduction in child malnutrition is partially attributable to the National Supplementary Feeding Program, the extension of coverage in children's services, and the rising educational level of mothers. Malnutrition is more prevalent in those regions that have a lower proportion of urban population (Antofagasta, Coquimbo, and Libertador O'Higgins), which also are among the poorest in the country. At the commune level, prevalence varies widely depending on socioeconomic conditions and place of residence, reaching levels as high as 33% in the poorest sectors.

With regard to maternal malnutrition, in 1989, 23% of all pregnant women being monitored by the SNSS were underweight for gestational age, but by 1992 this figure had declined to 16.2%.

The prevalence of diabetes ranges from 3% to 8% in the general population over the age of 20. Projection of this rate yields, in absolute numbers, up to 620,000 affected individuals in the country as a whole. Diabetes is increasing significantly as a primary cause of hospitalization, in addition to frequently being an associated disease.

In 1990, 11,650 patients with diabetes mellitus were hospitalized, representing a rate of 8.84 per 10,000 population and 35.8 per 10,000 in the group aged 45 and over.

Cardiovascular Diseases

More than one-fourth of all deaths are due to cardiovascular diseases (27.5%), for a rate of 163.7 per 100,000 population in 1990—one of the lowest since 1979 in a pattern that has hovered around 168 per 100,000. Cardiovascular diseases have a hospitalization rate of 5.1 per 1,000 inhabitants in the general population and 19.3 per 1,000 in the population aged 45 and over. The leading causes of morbidity in this group are diseases of the heart and pulmonary circulation (ICD-9, 415-429), which together make for a hospitalization rate of 1.2 per 1,000 in the general population and 4.8 per 1,000 in the 45-and-over age group.

Cerebrovascular diseases (430-438) rank second after cardiovascular diseases, and have a hospitalization rate of 1.1 per 1,000 general population and 4.7 in the population 45 and older.

Ischemic heart disease (410-414) is the most important in terms of mortality: myocardial infarction accounts for 23.7% of all deaths. This group of causes has a hospitalization rate of 0.8 per 1,000 in the general population and 3.8 per 1,000 among adults aged 45 and over. The highest mortality rates from these causes are found in the Valparaíso and metropolitan Santiago regions.

For hypertensive disease (401-405), the hospitalization rates are 0.3 per 1,000 in the general population and 2.6 per 1,000 in those aged 45 and over. In some of the population groups studied it is estimated that 20% of adults over the age of 20 have elevated blood pressure and that 92% of the cases are essential hypertension.

Acute and chronic rheumatic diseases (390-398) are responsible for a hospitalization rate of 0.2 per 1,000 population in the country as a whole and 0.3 per 1,000 in the age group 45 years old and older.

Malignant Neoplasms

In 1980, mortality from malignant neoplasms was 101.6 per 100,000 population, and the rate subsequently rose to 104.3 per 100,000 in 1987 and 109.3 per 100,000 in 1991. The most frequent sites are the stomach and the

esophagus, which account for 23.7% of all neoplasms, but this percentage is yielding to a rise in deaths from cancer of the lung and of the liver and bile ducts.

In 1990, the 10 leading sites of malignant neoplasms in the population aged 15 and over were the following: stomach (18.1%), lung (10.1%), gallbladder (9.5%), breast (5.8%), cervix uteri (5.6%), prostate (4.9%), liver and bile ducts (4.4%), and esophagus (4.2%). In the population under 15 years old, leukemias accounted for 65.2% of all malignant neoplasms.

Morbidity statistics for patients hospitalized during 1990 implicated the following sites (their respective hospitalization rates per 10,000 population appear in parentheses): cervix uteri (3.08), breast (2.58), stomach (2.58), leukemias (1.59), trachea, bronchia, and lung (1.31), colon and rectum (1.22), gallbladder and bile ducts (1.19), prostate (1.18), corpus uteri (0.93), skin (0.88), and esophagus (0.78).

Accidents and Violence

In 1991, conditions due to injuries, poisoning, and violence were together responsible for a mortality rate of 69.1 per 100,000 population, and during the last decade, this group's contribution to mortality ranged between 11% and 12%. Thirty-eight percent of the deaths from violent causes were due to accidents in general, and almost one-fourth of these were motor vehicle accidents. According to police data, the number of persons injured in traffic accidents increased from 25,176 in 1980 to 36,092 in 1990, and the number of deaths from this cause rose during the same period from 1,191 to 1,587.

Behavioral Disorders

Psychiatric disorders account for more than 10% of SNSS consultations and 7% in private practice. Of the medical leave granted by the National Health Fund (FONASA), 5.6% was for neuroses. About 15% of the adult population abuses alcohol.

Hepatic diseases continue to be important, particularly cirrhosis, which is a significant factor in mortality associated with alcoholism and smoking. The death rate from this cause was 27.4 per 100,000 population in 1989 and 28.5 per 100,000 in 1990. In the latter year 6,209 patients were discharged from hospitals with a diagnosis of cirrhosis, for a hospitalization rate of 4.7 per 10,000 general population and 17.7 per 10,000 persons aged 45 and over.

Alcoholism is responsible for 4.5% of all hospitalizations; it is the direct cause of 7% of all deaths, and it is an associated cause in 38% of all discharges and 25% of all deaths. Alcholema is involved in 48.6% of all homicides and 38.6% of suicides, as well as in 50% of all traffic accidents.

In 1984, the last year for which information is available, the prevalence of smoking was 44% in men and 39% in women in Santiago.

Oral Health

In 1990, the prevalence of caries in the population was 91% and the average number of missing teeth at the age of 40 was 12.8 per person. In metropolitan Santiago the DMF index in children seen in the outpatient services who already had their full permanent teeth was 6.27.

Risk Factors

Risks in the Physical Environment

Drinking water coverage reaches 98% of the urban population, 73% of the concentrated rural population, and 8.2% of the scattered rural population; total coverage for the country as a whole is 82%. Systematic monitoring of the services has shown that during 1986-1990, the population served by distribution networks that deliver drinking water of good bacteriological quality exceeds 95%, and that 90% of this population receives water that meets physical and chemical standards.

Excreta elimination services are provided for 80.8% of the urban population and 20.6% of the rural population, and total coverage for the country is 70%. These high levels, however, do not necessarily mean that there are facilities for the treatment of sewage. On the contrary, 97% of the public sewerage systems empty untreated wastewater into rivers, lakes, or the ocean, and in some cases the water from these bodies is subsequently used for agricultural irrigation.

Particulate matter, primarily from diesel-engine emissions of public transportation vehicles, is a serious air pollution problem in Santiago, and it is aggravated by the city's 300-m altitude and by the fact that it is ringed by mountains, which together produce an inversion phenomenon. It is believed that this situation causes increased rates of obstructive bronchial disease in children under the age of 2, as well as increased

mortality from respiratory and cardiovascular diseases in the susceptible population groups (children under 2 and persons over the age of 65). The town of Chuquicamata in the Antofagasta region has serious problems with arsenic and sulfur dioxide pollution, and several localities along the northern coast are plagued by emissions of odoriferous substances from the fish meal industry.

Solid waste collection is provided only in urban areas, where coverage in 1992 was 98.5%. Of the solid wastes collected, 70.5% were deposited in sanitary landfills and 29.5% in open-air dumps.

There is industrial effluent contamination from the mining industry in the Antofagasta region, from the manufacturing industry in the metropolitan Santiago and Ñuble regions, and from forest exploitation in Ñuble, Araucanía, and Valdivia. Pesticide contamination of water courses mainly affects the area bounded by Valparaíso in the north and Valdivia in the south.

Food Contamination

In 1988, 8.9% of the food samples taken failed to meet the standards for bacteriological quality specified in the Chilean Food Safety Regulations. The proportion was 8.2% with respect to chemical microbiological standards.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

Social Policies

The Government's social policy is guided by the general criteria of equity, social empowerment, social participation, respect for human dignity, and solidarity.

According to the 1980 Constitution, health is a basic human right, and it is the State's duty to guarantee that all of Chile's inhabitants enjoy the right to health protection and a pollution-free environment. The Constitution also stipulates that the people shall have the right to avail themselves of their health system of choice, whether provided by the State or by the private sector.

The specific function of the Ministry of Health is to guarantee free and equal access to health promotion, protection, and restoration and rehabilitation of the

sick, as well as to coordinate, control, and, as appropriate, execute actions to that end. The Ministry of Health also sets health policies under guidelines indicated by the Government.

Health Policies and Strategies

Organization and Administration of Health Sector Institutions. Chile's health care system involves the participation of both the public and the private sectors. Since 1980 it has undergone a major transformation in two respects: the private sector has played an increasingly greater role in the financing and delivery of services, and decentralization is well under way, with responsibility for the administration of primary care being transferred to the municipios. In an effort to maximize the effectiveness of decentralization, greater authority has been given to the health services. Executive power has been delegated to the regional governments throughout the country, and this is expected to have a decisive effect on the decentralization of the health services.

Human Resources. Policies are geared toward ensuring adequate and qualified human resources in the public sector and toward introducing performance evaluation mechanisms. Steps are being taken to strengthen personnel management capacity in the local health systems and to give the systems more flexibility in maintaining and developing human resources. At the same time, ways are being sought to reward efficiency and encourage the involvement of health service personnel directly.

Expenditure and Financing. Policies in this area aim at introducing incentives to encourage efficiency within the programs and in the management of resources, improving cost-recovery systems in terms of direct payment of benefits, undertaking initiatives (such as the sale-purchase of services) that will streamline the cooperation between the public and private sectors, and strengthening the system of free choice, for which the State is responsible, through a modern, efficient, and decentralized administration. It also intends to revise the standards governing private health insurance institutions (the ISAPRE programs) with a view to improving relationships with users.

Physical Resources. Policies in this area aim at improving proposal formulation and evaluation, tech-

niques for the analysis of health care systems, and operation of the assistance network, as well as at supporting the development of local capacity to generate, evaluate, execute, and follow up on investment projects. There also are policies on the evaluation of technology and the procedures for procuring it, so that it will appropriately protect the population's health and maintain the system's effectiveness and so that economies of scale can be taken advantage of in the purchase of supplies and in the procurement, operation, and maintenance of equipment.

The Environment. There are policies in place designed to improve the normative, supervisory, and monitoring capacity of the national and regional environmental services; to develop incentives for reducing contamination sources; and to carry out mass education activities.

Health Programs for Individuals. Policies in this regard emphasize preventive actions and encourage greater participation by people in their own self-care. They also call for reviewing the programs and adjusting them to new epidemiologic patterns, incorporating technological changes as required, increasing decision-making power at the health care delivery level, and modifying the referral systems. These policies envisage strengthening coordination between various levels of complexity in the health care system and with the community; they also seek to foster the community's participation and the promotion of changes in personal lifestyles and in programs for individual and environmental care, emphasizing health education, early diagnosis, and timely treatment as well as the establishment of epidemiologic surveillance networks.

Health Legislation, Regulation, and Control. The Ministry is pressing for legislation that will ensure more efficient performance of the normative, supervisory, and coordinating functions that the State has entrusted to it. The draft legislation proposals include a law governing the health insurance institutions (ISAPRE programs) that will help to consolidate the private health sector; a law on the professional certification of physicians and others; a law to regulate tobacco use; an amendment to current legislation on organ donations and transplants; and regulations covering the duties, obligations, and rights of personnel working in those health establishments being transferred to municipal management.

Organization of Services

Personal Health Care Services

Infrastructure. In Chile the public subsector consists of the following agencies under the National Health Services System (SNSS): the Ministry of Health; the 27 health services located throughout the country; the National Health Fund (FONASA); the Public Health Institute; the Central Supply Clearinghouse; and the ISAPRE Authority. All of them have been decentralized. The sector also includes governmental institutions and enterprises that provide health care for their personnel.

In each region, the Ministry is represented by a regional Ministry of Health secretariat. The 26 health services and the one specialized health service (the Metropolitan Environmental Health Service) provide medical and health assistance for the population in their corresponding jurisdictions through their health care establishments and units.

FONASA is the agency responsible for collecting administering, and distributing State funds in the area of health. It has a central office and 13 regional agencies for managing the free-choice programs.

The Public Health Institute serves as the national laboratory.

The Central Supply Clearinghouse is responsible for the centralized procurement and supply of drugs, laboratory and pharmaceutical products, surgical equipment, instruments, and other supplies needed by all entities and individuals that are employed within the system or assigned to it.

The health services are structured according to three levels of care—primary, secondary, and tertiary—based on the complexity of the units in question.

In 1988, the process of transferring the administration of primary care to the municipal level, which began in 1981, was completed. Most of the general clinics in urban and rural areas, rural health posts, and the rural medical stations are now under municipal management.

The private subsector includes both nonprofit and for-profit institutions.

The nonprofit institutions include charities that operate outpatient care facilities. This category also includes employer associations that are financed through a basic deduction of 0.9% on taxable wages plus an additional assessment depending on the risk of the enterprise. These associations operate hospitals, clinics, and outpatient centers.

The for-profit institutions include persons and establishments that provide private medical and health care on a fee-for-service basis. They account for 0.6 of the 3.2 beds per 1,000 population available in the country. The ISAPRE system, in turn, provides mechanisms for the financing of private health care. The number of ISAPRE programs has steadily increased since 1981, when the system was first introduced and six ISAPRE programs started to offer services. By 1992, a total of 34 programs were in operation; of these, 20 had open membership and 14 had closed membership. The number of contributors enrolled in the various plans increased 40-fold in ISAPRE's first decade of operation, with an average annual growth rate of 45%.

Coverage. The SNSS provides coverage for nearly 80% of the Chilean population through its network of health care establishments and units throughout the country.

In June 1992, the 34 ISAPRE programs had 2.77 million subscribers. With an average coverage of 20.4% nationwide, there are regional variations ranging from highs of 31.8% in metropolitan Santiago, 28.1% in Tarapacá, 42.8% in Antofagasta, and 29.1% in Atacama in the north to lows of 8.9% in Maule and 8.7% in Araucanía in the south. The mining sector's closed-membership ISAPRE programs in Antofagasta and Atacama are especially large.

With respect to the distribution of ISAPRE coverage by sex and age, as of December 1992 there were 2.2 male subscribers for every woman—a fact that may be explained largely by the greater participation of males in the active work force. In terms of age, the young population predominates: the highest proportion of coverage corresponds to the 25-to-34 age group (24.7%), after which the percentage declines steadily and reaches its lowest level with the elderly (5.7%).

For many years the number of available SNSS beds was around 33,000, but after 1980 this figure began to decrease slightly, and in 1991 it was 31,674. There are 2.5 beds per 1,000 population, and the bed occupancy rate is 75%.

In 1990, a total of 1.4 million patients were discharged from the country's hospital services; in 1991, the number of discharges for the SNSS was 1,043,702, with an average of 7.3 days per stay and a turnover of 32.3 discharges per bed. The SNSS accounts for 109.6 discharges per 1,000 population; the rate for the open ISAPRE programs is 81.6 discharges per 1,000 subscribers and for the closed ISAPRE services it is 113.5 per 1,000.

The SNSS meets 63.9% of the demand for medical care, while other public sector establishments are responsible for an additional 6.2%. Of the 27.6 million medical visits attended by FONASA, the ISAPRE programs, and the SNSS, the latter handled 20.7 million (75%). In terms of annual visits per beneficiary, the figure for the SNSS was 2.3 visits; the open ISAPRE programs, 3.1; and the closed ISAPRE services, 5.8. In the case of the SNSS, if the visits attended by nonmedical personnel (auxiliaries, nurses, and midwives) are included, the average per person comes to 3.9.

The number of annual SNSS visits increased steadily from 1970 to 1991, by which time the figure had more than doubled—from 10.7 to 22.5 million. Women's visits increased by 132%, and those for children by 126%. The relative proportion of emergency consultations ranged from 26.6% to 30% during the period.

In 1991, nurses attended a total of 4.4 million checkups and other visits, and these were mainly services for children. Midwives, in turn, attended 4.6 million checkups and consultations under women's programs. Another 4.4 million visits were handled by nursing auxiliaries.

With regard to delivery care, in 1990 the proportion of cesarean sections was quite high in the private sector (53.9%) and the ISAPRE programs (45.2%), compared with the SNSS, (23.7%).

Environmental Services

Programs that address the environmental situation come under the Ministry of Health's Department of the Environment and the equivalent departments in the health services. There is a special service in the metropolitan Santiago region.

Social Access and Participation

Physical and geographical access to the health services is generally good, although there are still some rural areas which, because of their scattered population or difficult terrain, do not yet have a basic health infrastructure.

Regarding economic access, approximately 72% of the country's inhabitants are entitled to benefits under the government system. Of this population, 59% are poor and have no other option.

In terms of access by specific cultural or ethnic groups, the public system has mounted a program to

address the needs of ethnic minorities, several groups of which live in isolated areas of the Araucanía region.

During 1990–1992, the Government promoted and implemented various measures designed to improve access to health services. These included providing free primary health care, assigning special hours and shortening the waiting lists for surgical interventions, extending schedules to include evening hours at urban general clinics, setting up emergency primary care services in urban areas, improving transportation for patients by acquiring new ambulances, placing mobile care units in operation for the health team, opening new clinics in urban and rural areas, and increasing the amount of the Government's financial contribution for delivery care.

Health Research

The most important source of support for health research is the Fund for Science and Technology Development. During 1991, 90 proposals were approved in the area of health, corresponding to 13.3% of the proposals approved. Resources allocated for the area represented 20.1% of all funds invested.

Available Resources

Human Resources

According to data furnished by the College of Physicians, in 1991 Chile had a total of 14,664 physicians of whom 3,953 were women (27%). There were 11 physicians per 10,000 population. However, the same institution estimated in 1985 that only 79% of Chile's doctors were practicing their profession, which would reduce the actual ratio to 8.7 per 10,000 population. The same source has estimated that 82% of the country's physicians work in institutions and the remaining 18% work in private practice.

In 1992, the SNSS employed 8,333 physicians—a fairly sizable increase over the estimated average of 7,000 for the 1980–1990 period. This number represents 62% of all practicing physicians, which means that the SNSS continues to be the number one employer.

There are about 7,000 dentists in Chile, or 5.2 per 10,000 population, and of these, the SNSS employs at least 1,900.

In 1990 the SNSS had 2,830 positions for nurses, of which only 2,400 were filled. The number of midwives also has declined in recent years: only 1,600 of the 2,000

positions were filled. These two categories would appear to be the most critically needed human resources in the sector.

Chile has 0.2 pharmacists per 10,000 population, 0.5 social workers, 0.6 nutritionists, 0.3 kinesiologists, 0.8 medical technologists, and 0.008 occupational therapists. In 1990, the SNSS had 23,369 paramedical and nursing auxiliaries, representing a ratio of 20.9 auxiliaries per 10,000 population.

Financial Resources

Health is basically financed by the State through national budget funds and contributions for health activities from the municipalities and government institutions. All employed and retired workers contribute a compulsory 7% of their salary or pension, which goes to either the ISAPRE institutions or FONASA. In addition, they may also make a voluntary contribution and upgrade their health plan. Other sources of financing include direct payments for benefits and fixed-rate co-payments for goods and services made to the ISAPRE programs and FONASA, funds raised through assessments, and voluntary donations.

Public expenditure on health as a percentage of the GDP declined from 2.6% in 1980 to 2.3% in 1990; in 1991 it increased to 2.4%, and by 1992 it had risen to 2.7%. According to provisional data, public expenditure in health in 1992 amounted to the equivalent of US\$ 1,073 million, or an average of US\$ 71.07 per inhabitant. In absolute numbers, public expenditure on health declined or remained stationary from 1984 through 1987, increased in 1988, leveled off until 1990, and began to rise sharply starting in 1991. Relative to 1984, the expenditure on health increased steadily over the 1984–1990 period; in 1991 it was 33% higher, and by 1992 it was up by 57%.

Salaries represented 40% of total public expenditure in 1984, but by 1988 the proportion had declined to less than 35% and has remained at approximately that level, standing at 34% in 1992. The SNSS expenditure per worker, in 1992 currency, came to the equivalent of US\$ 4,688.60, and the number of workers and their salaries, increased. Expenditure for consumer goods and services has generally tended to increase, both as a proportion of public expenditure and in monetary terms. Spending on social benefits, which in 1984 represented 26.7% of the total public expenditure on health, fell to 20.5% in 1987 and then to 15.5% in 1992.

Transfers remained relatively steady at proportions ranging from 6.5% in 1984 to 9.5% in 1988. Up until

1988, almost all the transfers went to the National Supplementary Feeding Program (PNAC). In 1989, transfers represented 12.7% of the public expenditure, and in 1992 the figure was 11.8%. Of the amount involved, less than 60% went to the PNAC that year.

In 1992, the budgeted expenditure for real investment exceeded the equivalent of US\$ 82.7 million, or 8.7% of the total health expenditure. This sum—the largest amount to be allocated for physical investments in more than 15 years—was used, in conjunction with projects funded by loans from external agencies, to upgrade physical plants in the public sector. Fiscal expenditure on health reached its lowest point in history—namely 4.2%—during the 1987–1989 period.

Only partial information is available on private expenditure in the area of health and the proportion that it represents relative to institutional spending. ISAPRE expenditures increased ninefold over the 1984–1992 period, reaching a sum in excess of US\$ 689.5 million, or 1.9% of the GDP. This expenditure, which in 1984 represented less than one-third of the fiscal expenditure and barely one-tenth of the total public expenditure, rose to 60% of the fiscal expenditure in 1992 and was only 30% less than the total public expenditure.

Physical Resources

In 1991, the SNSS had 180 hospitals of various levels of complexity and decision-making autonomy throughout the national territory.

Chile has 3.2 hospital beds per 1,000 population, and 3 out of every 4 of these beds are provided by the SNSS. Over the 1970–1991 period, the number of SNSS hospital beds declined from 33,611 to 32,127, while at the same time, the number in the private sector increased from 2,321 to 10,947.

The SNSS provides ambulatory care through its emergency services, hospital outpatient clinics, and primary care units, which in 1991 comprised 345 general clinics in urban and rural areas, 1,040 rural health posts, and 1,214 rural medical stations.

In 1991, the private subsector had 210 hospitals and other inpatient establishments with a total of 8,260 beds. In addition, it had 14 clinics with 154 beds and 22 centers with 1,206 beds for nutritional care. It provided outpatient care through 1,206 medical centers, clinics, and polyclinics, and it had 508 registered clinical laboratories. Completing the health care network were 10 hospitals, 4 polyclinics, and an unknown number of outpatient clinics managed by other public sector institutions and State enterprises.

There are many representatives of transnational companies engaged in the production or marketing of medical and other health-related products and equipment.

Chile imports almost 90% of the raw materials used for the production of pharmaceuticals, and final formulation for clinical use, labeling, and packaging are done in the country. The proportion is reversed, however, in the production of homeopathic remedies; this latter industry is able to avail itself of large quantities of national raw materials.

The Public Health Institute, an agency under the Ministry of Health, has had long experience in the production of viral and bacterial vaccines from both killed and live strains. The country has the capacity to produce vaccines against human rabies, diphtheria, tetanus, whooping cough, and typhus (injectable), as well as heterologous tetanus antitoxin for local use.

Extrasectoral Resources

Resources received from outside the sector have included loans to the Government of Chile from the World Bank and the Inter-American Development Bank for investments in health. In addition, the governments of France, Germany, Italy, Spain, Switzerland, and the United States of America have contributed funds for specific projects in the public sector. Altogether, the total funds amount to approximately US\$ 22 million in donations and US\$ 49 million in loans.

COLOMBIA

GENERAL HEALTH SITUATION AND TRENDS

Colombia has an area of 1,141,748 km² and comprises five major natural regions: Atlantic, Pacific, Andean, Orinoco, and Amazon. It is divided into 33 political and administrative departments and a Capital District with administrative autonomy. There are a total of 1,033 smaller geopolitical units, termed *municipios*. In 1992 the estimated population was 33.4 million, with a population density of 29 inhabitants per km².

The Economic Situation and the Adjustment Process

The first manifestation of the economic crisis came in 1982 with the declaration of an economic emergency by the Government. The adjustment process began in 1985 with a series of measures aimed at achieving macroeconomic stability; a second phase, initiated in 1990, seeks to stimulate the efficiency of production factors.

The measures implemented under the first phase of the adjustment process basically tended to accelerate the rate of devaluation and curb wage increases. The Government sought to keep the proportion of public investment in the GDP constant and to minimize deterioration of the incomes of the most underprivileged groups. During the second phase, a program of economic liberalization was begun, which brought growth in imports and a decline in exports. A reduction in economic growth in the short term is expected, with an increase in unemployment and a decline in the wages of the poor.

Investment in the social sectors suffered during the decade as a result of various social phenomena, notably armed conflict, drug trafficking and terrorism, administrative corruption, and the gap between civil society and government institutions. The armed conflict dates back to the 1940s; in the 1980s programs were proposed with a view to restoring peace and reincorporating several guerilla groups into the

broader society. The problem continues to be a priority in the life of the country, as it causes large numbers of deaths and injuries. Moreover, it has an enormous economic impact, mainly in the energy and oil sectors, and makes it necessary to invest huge amounts in the armed forces, diverting national funds away from social investment. Drug trafficking and the terrorism that accompanies it have had a tremendous social impact, both directly, by victimizing the population, and indirectly, by reducing the resources available for social investment. These problems, together with inefficiency in public administration and management and other problems, have led to a loss of confidence in State institutions. This has translated into a steady decline in electoral participation, which in 1985 was 50.3%, but by 1990 had dropped to 39.6%.

In July 1991 the National Constituent Assembly promulgated a new political constitution. As concerns health, article 48 of the constitution defines social security as a public service to be provided under the direction, coordination, and control of the State on the basis of the principles of efficiency, universality, and solidarity. Health is declared to be an inalienable right of all citizens. In addition, participation by the private sector in the delivery of the various services is officially authorized. Article 49 establishes that health care and environmental sanitation are public services under the responsibility of the State, and all persons are guaranteed access to services for the promotion, protection, and recovery of health. It mandates that services are to be decentralized and organized by levels of complexity, with participation by the community. The constitution also affirms that primary care shall be free and obligatory, and that it is a duty of all persons to endeavor to maintain their own health and that of their communities.

Living Conditions

Estimates of the extent of poverty in the country are derived from information contained in the 1985 population census and the survey of households carried out periodically by the National Administrative Depart-

ment of Statistics (DANE) in seven cities of the country.

According to data from the National Department of Planning, the proportion of poor people, as determined by income level in relation to the poverty line, has decreased steadily, falling from 41% in 1970 to 28% in 1979 and to 25% in 1989. However, according to other estimates made on the basis of household surveys, the proportion of poor people has risen, from 37.8% in 1986 to 40.8% in 1990 and to 44.8% in 1992.

If the indicator "unmet basic needs" (UBN) is used as a yardstick for measuring poverty, it becomes apparent that there is considerable variation among departments. For the country as a whole, in 1985 (last year for which information is available) the percentage of poor people was 45.6% (12.5 million people). Of these people, 22.8% (6.2 million) were living in critical poverty, with UBN values ranging from 82% in Chocó to 23.5% in the District of Bogotá (critical poverty levels of 44.0% and 6.2%, respectively). In the seven principal cities the percentage of poor persons and households has declined steadily. In these areas the proportion of poor people decreased from 21.6% in 1986 to 16.0% in 1990 and 15.5% in 1991; for the same years, the percentages of the population living in critical poverty were 6.1%, 3.9%, and 3.6%, respectively. The proportion of poor households declined from 18.0% in 1986 to 12.7% in 1990 and 12.3% in 1991, with 4.6%, 2.7%, and 2.6%, respectively, in critical poverty. In rural areas, however, estimates for 1988 indicated that between 63.6% and 68.0% of the people were poor (35.0% in critical poverty), while the proportion of poor households was 59.0% (30.2% in critical poverty).

As the foregoing reveals, estimates vary depending on the source of the information and the methodology used. According to some sources, there has been a notable increase in poverty as measured by income level in recent years, although this has not translated into a worsening of the UBN indicator, which tends to remain more stable. There are marked differences in this indicator between departments and cities and between urban and rural areas.

Among the population over 5 years of age, 9.5% of the males and 8.6% of the females have had no formal schooling; the highest percentages are found among men and women older than 50 years in rural areas and in the Atlantic coastal region. Available information indicates that the illiteracy rate among those older than 15 years decreased from 21% in 1973 to 11% in 1990. The average number of years of schooling increased from 5.0 in 1973 to 6.1 in 1990 for the country as a whole (8.1 in urban areas and 4.6 in rural areas). The

District of Bogotá, at 9.6 years, had the highest level, whereas the average number of years in other regions and subregions ranged from 4.3 to 5.2. Of the population aged 6–15, 74% attend school (82% in urban areas and 62% in rural areas). Coverage for primary education remained at 92.0% from 1975 to 1990; for the secondary level it increased from 30.7% to 46.0%; and for higher education it rose from 6.3% to 10.3%. The male-to-female ratio at the primary and the university levels was 1:1 in 1988.

Per capita GDP rose from US\$ 633 in 1970 (in constant 1990 dollars) to \$844 in 1980 and \$992 in 1989. An analysis of income distribution by economic strata reveals that the lowest-income population had an 18.0% share of the GDP in 1971; that figure increased to 18.9% in 1980 and to 19.6% in 1992. For the highest-income strata, the figures ranged from 50.2% in 1971 to 50.4% in 1992. Nevertheless, the Gini coefficient, a measure of income concentration, increased from 0.46 in 1980 to 0.50 in 1989 and then showed a tendency to deteriorate in 1992, when it was calculated at 0.45.

After having remained stable since 1988, average annual unemployment rates rose from 9.0% in 1980 to 11.2% in 1992. Rates of underemployment increased from 12.8% in 1988 to 15.5% in 1992. The proportion of the work force in temporary employment went up from 14.6% in 1988 to 21.2% in 1992.

The early-1980s policy to increase the minimum wage translated into a real increase in the urban minimum wage of 4.4% in 1982 and 5.2% in 1984. The rural minimum wage rose by 6.2% and 8.9%, respectively, in the same years. For 1988, 1990, and 1992 the real minimum wage decreased by 2.4%, 4.8%, and 1.6%, respectively, in relation to the immediately preceding year.

The total proportion of households with deficient housing conditions decreased from 52.5% in 1973 to 32.2% in 1985. In the latter year, 12.9% of all urban housing was physically inadequate, 12.6% was critically overcrowded, and 21.0% had no basic sanitation services (for rural areas the corresponding figures were 26.1%, 16.3%, and 49.3%). In 1990, 99% of homes in urban areas and 71% of those in rural areas had electricity. In 1991, 70.6% of the total population (81.1% of the urban and 33.7% of the rural) was connected to the water supply system and 43% of the urban population had sewerage. According to the 1985 census, 95% of urban dwellings had electricity, 89% were connected to the water supply system, and 81% had sewerage (the figures for rural areas were 43%, 29%, and 13%, respectively). Among poor households, one study showed that 60% of those in poverty and 77% of those in critical poverty lacked access to drinking water (86%

and 93%, respectively, in rural areas); 84% of poor households and 88% of critically poor households were not connected to the sewer system.

Population

Of the 33.4 million inhabitants of the country, 49.6% are male and 50.4% are female. The population distribution is as follows: Andean region, 41.5%; Atlantic, 20.7%; Pacific, 16.8%; Orinoco, 2.5%; Amazon, 2.2%; and District of Bogotá, 16.3%. The population growth rate has been estimated at 2.0% for the period 1985–1990 and at 1.9% for 1990–1995. The rate has been declining steadily (for the period 1970–1975 it was 2.3%). The age group under 15 years made up 46.8% of the total population in 1965 but only 36.0% in 1990. The 15–64-year age group constituted 48.1% of the population in 1965, 60.0% in 1985, and 57.9% in 1990. Those aged 60 or older were 6.1% of the total population in 1990 (as compared to 5.1% in 1965 and 5.9% in 1985). In 1990 the proportion of the population under 15 was larger in rural areas (40.9%) than in urban areas (33.7%), but for the population aged 15–64 the reverse was true (55.1% rural and 62.4% urban). The proportion of those over 65 was about the same in urban and rural areas. The region with the youngest population was the Atlantic region (39.1% under 15 and 57.3% aged 15–64); the oldest population was found in the District of Bogotá (31.3% and 65.5%, respectively).

There are currently 81 indigenous groups living in Colombia. They are distributed in 450 communities located in the Amazon and Orinoco regions, along the Pacific coast, in the Andes mountains, and on the La Guajira peninsula. The total indigenous population is approximately 600,000. These ethnic groups are quite diverse linguistically (20 languages) and in terms of sociocultural characteristics and forms of government.

The birth rate has been estimated at 27.4 per 1,000 for 1985–1990 and at 25.8 per 1,000 for 1990–1995. During the period 1970–1975, the mean annual rate was 34.5 per 1,000. Although registration of births is compulsory, in 1989 underregistration was as high as 41% overall, with substantial variations by region (11% in the District of Bogotá versus 63% in the Atlantic region) and by education level of the mother (58% among those with no formal schooling versus 18.0% among those with a secondary education).

Mortality was estimated at 6.1 per 1,000 population for 1985–1990 and at 5.2 per 1,000 for 1990–1995. A survey of health knowledge, attitudes, and practices

found a crude death rate for the period 1986–1989 of 5.2 per 1,000. During 1970–1975 the mean annual rate was 8.7.

The estimated general fertility rate for 1990 was 105 births per 1,000 women of childbearing age. The total fertility rate was 2.9 children per woman (2.5 in urban areas and 3.8 in rural areas). A comparison of information by region reveals that there is a difference of more than one child between the highest fertility level (3.6 children per woman), which is found in the Atlantic region, and the level in the District of Bogotá; all the other regions have fertility rates of under 3.0. Between 1984 and 1990, fertility declined most rapidly in rural areas. The total fertility rate in urban areas decreased from 2.7 children per woman to 2.5, while in rural areas it dropped from 4.5 to 3.8 (a 27% reduction during the period). Fertility decreased in all the regions with respect to 1986 levels. The biggest reductions occurred in the Pacific and Orinoco regions (26% and 20%, respectively) and among women aged 30 and older. In relation to education level, the rate among women without any formal schooling was 4.9 children, while among those with higher education it was 1.6.

In 1951, 42.6% of the population lived in urban areas. This figure had grown to 67.2% by 1985 and to 70.3% by 1990. Migration from rural to urban areas has diminished in recent years; a study carried out in the city of Santa Fe de Bogotá showed that the majority of immigrants (71%) come from large or medium-size cities and the minority (11%) come from rural areas. Recent studies have revealed new migratory flows, as yet unquantified, from areas where social tensions are high owing to drug trafficking, guerrilla warfare, and the activities of paramilitary groups.

Life expectancy at birth for the period 1990–1995 was estimated at 69.3 years: 72.3 years for women and 66.4 years for men. In 1970–1975 this indicator had stood at 61.6 years.

Mortality

Underreporting of deaths was estimated at 22% in 1990. The survey of knowledge, attitudes, and practices found 15% underreporting for 1986–1989. Of the 163,369 deaths recorded in 1991, no death certificate was issued for 14,624 (8.9%), according to DANE records. Among those deaths for which a death certificate was issued, no medical attention had been rendered in 60% of cases. Crude death rates were 5.6 per 1,000 among men and 4.8 among women; the figures

for urban and rural areas were 4.9 and 5.8 per 1,000, respectively.

During the period 1970–1975 the infant mortality rate was 73.0 per 1,000 live births. By 1986 it had fallen to 41.1 per 1,000, and in 1992 it was estimated at 37 per 1,000. There are marked differences between regions (along the Pacific coast and in the departments of the Orinoco region the rate was as high as 110 per 1,000, whereas in the District of Bogotá it was only 10.7). The rate in urban areas was 36.8 per 1,000, while in rural areas it was 47.8.

In relation to education level of the mothers, in 1980–1990 the infant mortality rate was 60 per 1,000 among children whose mothers had no formal education but 11 per 1,000 among children whose mothers had postsecondary education. The rate was 76 per 1,000 among children living in critical poverty and 61 per 1,000 among those in households with unmet basic needs.

In 1977 there were 19.2 maternal deaths per 10,000 live births. The rate was 17.1 per 10,000 in 1981 and 11.0 per 10,000 in 1990. The vast majority (98%) of all maternal deaths were due to avoidable causes.

A general trend has been observed toward decreasing mortality in all age groups, especially among females. Among males aged 15–44 years this downward trend ceased in 1975, and mortality from homicide and purposely inflicted injury rose during the period 1980–1990 and in the early 1990s.

During 1987–1990 a total of 614,405 deaths were recorded in the country, 95.8% due to defined causes. An analysis of mortality by major groups of causes reveals that 29.3% of the deaths were due to diseases of the circulatory system, 23.0% to external causes, 13.0% to malignant neoplasms, 8.7% to communicable diseases, and 3.7% to conditions originating in the perinatal period, with other causes accounting for the remaining 18.0%. During the same period there was an increase in the number of deaths from external causes (from 1,036 to 1,150 per 100,000) and from diseases of the circulatory system (from 1,322 to 1,400) and a decrease in deaths from communicable diseases (from 480 to 474) and from conditions originating in the perinatal period (191 to 170).

An examination of trends from 1973 to 1990 with regard to selected causes shows a significant decline in deaths from intestinal infectious diseases (ICD-9, 001–009)—from 99.1 per 100,000 population to 35.4 in 1981 and 8.0 in 1990—and in deaths from acute respiratory infections (460–466, 480–487)—from 75.0 per 100,000 to 33.3 and 16.7, respectively. At the same time, there was a notable increase in deaths from homicide

(E960–E978, E990–E999), which climbed from 21.4 per 100,000 in 1973 to 37.6 in 1981 and 72.9 in 1990.

Leading causes of mortality differ between regions, as revealed by the figures for 1991. Signs, symptoms, and ill-defined conditions accounted for 3.9% of all deaths countrywide, with the proportion ranging from 1.0% in the District of Bogotá to 8.6% in the Atlantic region (Andean region, 3.4%; Orinoco, 4.1%; Pacific, 4.4%; and Amazon, 5.6%). Among defined causes, homicide ranks first in all regions except the Atlantic, where it is fourth, and the District of Bogotá, where it is second. As regards the proportional distribution, the Atlantic region and the District of Bogotá have the lowest proportions from this cause (9.3% and 10.1%, respectively) compared to the other regions, where homicide is responsible for approximately one-fourth of all deaths. The rates per 100,000 population range from 26.7 in the Atlantic region to 135.3 in the Andean. There are also large variations between departments within the same region; the homicide rate in Antioquia, for example, is seven times higher than in Boyacá (277.7 and 39.6 per 100,000, respectively). Similarly, within the same department the rate may be close to zero in some municipalities. It should be noted that in some regions the number of deaths from homicides is underestimated. This is due not only to the aforementioned problem of general underreporting—with the degree of underreporting varying widely from area to area in the country—but also to the fact that many such deaths are concealed within the cause group “other accidents, including late effects” (E900–E929) which includes deaths from accidents caused by firearm missile (E922). This group of causes ranks fifth in the Orinoco region (22.0 per 100,000), third in the Amazon region (37.0), seventh in the Andean region (20.2), and sixth in the Atlantic region (14.0).

Intestinal infectious diseases are among the 10 leading causes of death only in the Amazon and Orinoco regions, with rates of 27.9 and 11.0 per 100,000 and percentages of 5.1% and 2.7%, respectively. Traffic accidents are a particularly significant cause in the Andean region (ranking seventh, with a rate of 20.2 per 100,000), the Pacific region, and the District of Bogotá.

Chronic noncommunicable diseases affecting the circulatory system are a major cause of death in the Atlantic region (40.8%), the Andean region (24.8%), the Pacific region (25.4%), and the District of Bogotá (27.5%), and less important in the Amazon (17.0%) and the Orinoco (20.5%) regions. Conditions originating in the perinatal period rank sixth in the Orinoco region (with a rate of 20.9 per 100,000) and ninth in the Atlantic region (10.0), and diseases of the respiratory sys-

tem are in third place in the District of Bogotá (46.4) and in fifth in the Atlantic region (21.3). Malignant neoplasm of other digestive organs is the fourth leading cause of death in the District of Bogotá (39.0) and the sixth and seventh in the Amazon and Orinoco regions, respectively (rates of 29.8 and 17.9 per 100,000).

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Child and Adolescent Health

In 1991 deaths of children under 1 year old constituted 7.8% of all deaths (compared to 17.7% in 1980). Conditions originating in the perinatal period accounted for 40% of all infant mortality; congenital anomalies were the second leading cause (15.8%) and acute respiratory infections the third (14.3%). In 1986 the percentage distribution for these three causes was 46%, 12.0%, and 8.4%, respectively. The percentage share attributable to diarrheal diseases decreased from 12.5% to 10.6% during the same period. Protein-energy malnutrition continues to figure among the 10 leading causes of death (fifth place in 1986 and seventh in 1991).

As concerns morbidity, while acute diarrheal disease ranked first as a cause for doctor visits in 1990 (14.7%) and respiratory infections ranked second (11.9%), their rank order was reversed for hospital discharges (17.9% and 15.4%). The information available on morbidity by type of disease and on coverage is presented in subsequent sections of this report. Infections of the skin and respiratory infections ranked third and fourth, respectively, as causes of doctor visits. In 1990 communicable diseases were the cause associated with 42% of hospital discharges, while perinatal problems were associated with 36%. These figures represented no significant change with respect to 1986 (46% and 35%, respectively).

In children aged 1–4 years, communicable diseases caused 42% of the deaths in 1991 and 43% in 1986. In those same years, the leading causes of death were pneumonia (13.7% and 15.0%), enteritis and other diarrheal diseases (14.3% and 13.5%), and accidents caused by submersion, suffocation, and foreign bodies (7.1% and 5.8%). In 1991 the leading causes associated with hospital discharges were pneumonia and acute respiratory infections (22.9%), enteritis and other diarrheal diseases (13.6%), and bronchitis, emphysema,

and asthma (9.5%). The ranking of hospital discharges remained unchanged during the period.

In the 5–14-year age group, the four leading causes of death in both 1990 and 1986 were various categories of accidents and violence, which together accounted for 38% of all deaths in 1990 (homicide and injury purposely inflicted by other persons accounted for 9.2%). Next in order of importance were leukemia (5.3%) and pneumonia (5.1%). The most dramatic change was the increase in the number of homicides, which rose from 146 in 1987 (1.9 per 100,000) to 305 in 1991 (4.0 per 100,000).

Health care coverage for the 5–14-year age group is only 25%, which represents care in response to demand. The primary reason for contact with health services in this age group in 1991 was diseases of the teeth and supporting structures (24.0%), followed by acute respiratory infections (8.1%). The causes associated with hospital discharges were similar to those in 1986: fractures of limbs was in first place (7.0%), followed by appendicitis (6.2%), pneumonia (5.7%), and bronchitis, emphysema, and asthma (5.4%). Normal delivery was the seventh leading cause of hospital discharge in the group aged 10–14 years.

According to a study published in 1991, which describes the situation of youths aged 12–19 in the 14 largest cities in the country, 1,457,211 (83%) of a total of 1,740,416 persons in this age group were living in especially difficult circumstances. The principal problems cited were child labor and lack of preventive care. It is estimated that between 20% and 30% of young people aged 12–17 are in the work force, the proportion being higher in rural areas and among males.

Health of Adults

The group aged 15–64 years showed little change in mortality rates between 1987 and 1990, with the rate rising only slightly from 345 to 355 per 100,000. Deaths in the 15–44-year age group constituted 23.0% of all deaths in 1987 and 25.5% in 1990; in the age group 45–64 the figures were 20.0% and 19.8%, respectively. The death rate from homicide among those aged 15–44 increased from 97.8 per 100,000 in 1987 to 143.7 in 1990. Causes associated directly with accidents and homicide occupied the first four places among causes of death in the 15–44-year age group, producing 61.5% of the deaths in 1986 and 81.0% in 1990. The next most frequent causes in those same years were diseases of the circulatory system (9.4% and 5.3%) and malignant neoplasms (7.5% and 6.3%).

Health of the Elderly

Of all deaths in 1987 and 1990, 30% and 41.2%, respectively, were of persons aged 65 years or older. Diseases of the circulatory system caused 47.4% of the deaths in 1987 and 45.3% in 1990, while malignant neoplasms accounted for 16.4% and 16.0%, respectively, in those years.

Chronic and degenerative diseases, especially cardiovascular diseases, account for the greatest number of both doctor visits and hospital discharges, but the principal health problems among the elderly are disability, loss of independence, and diminished quality of life.

Workers' Health

The economically active population in Colombia was estimated at 9.5 million persons in 1990. According to estimates for 1993, the social security system covers 38.2% of the total population and 55.8% of the salaried population. Current social security services have a predominantly curative focus. What little information is available indicates that the most frequent problems of workers are hearing loss, respiratory disease, dermatitis, and poisoning by heavy metals.

Health of Indigenous Groups

According to a 1989 study on indigenous peoples in Colombia, the leading causes of disease and death from 1973 to 1986 among these groups were, in descending order, tuberculosis, malnutrition and other nutritional deficiencies, intestinal parasitosis, acute diarrheal disease, acute respiratory infections, malaria, diseases of the skin, infectious disease, diseases of the teeth and supporting structures, leishmaniasis, and viral diseases. This list stands in contrast to the leading causes of morbidity and mortality for the country as a whole.

With regard to human resources, a survey conducted in 1980 showed that the availability of health services for indigenous communities was below the national average. Whereas the number of physicians per 1,000 population was 0.8 for the whole country, the indigenous population had only 0.3 physicians per 1,000 population, and some groups, such as the Yucos (Sierra de Perijá) and the Motilones (Sierra de Catatumbo), have no health services available to them.

Health of Women

Of all women living with a male partner, 66.1% use some method of family planning. According to one survey, the average maternal age at the time the first child is born is 22.5 in urban areas and 21.1 in rural areas. Women with low educational levels begin having children at earlier ages (62% of women without any formal education have had a child before reaching 19 years of age, whereas only 5% of those with a secondary education have done so). Of the adolescent women living with a male partner, 38% use some method of contraception.

Homicide accounted for 16.7% of all female deaths in 1990 (it is the second most common cause of death in the female population aged 5–14 years, and the first among women 15–44). This cause is responsible for three times as many deaths as cerebrovascular disease and four times as many as acute myocardial infarction among women aged 15–44 years. Other types of violence, especially familial violence, are a constant in many women's relationships. It is estimated that 20% of all women living with a male partner have been beaten and 10% have had forced sexual relations.

Diseases and Health Impairments

The information available on morbidity includes figures on hospital discharges in all the subsectors and on doctor visits in the public and semipublic subsectors; data on presumptive diagnoses from a sample of 10% of the doctor visits are consolidated at the central level. These records, like those on notifiable diseases, are marred by underreporting and deficient coverage and quality, as well as problems with the application of case definition criteria and with the flow of information.

Vector-borne Diseases

Malaria. Ecological conditions are propitious for transmission of this disease in 72.3% of the national territory, an area where 69.4% of the population lives. In 1991 and 1992, 184,156 and 184,622 cases were reported (rates of 551.1 and 560.7 per 100,000, respectively), which was a considerable increase over the number of cases reported during 1987–1990 (rates of 294.1, 323.5, 316.0, and 308.0 per 100,000 population, respectively, for each of the years in that period). In 1990 there were 69 reported deaths from malaria. The

annual parasite index (API) rose from 2.89 per 1,000 in 1987 to 7.8 in 1992, and the annual index of *Plasmodium falciparum* infection increased from 0.89 to 2.91 per 100 during the same period. Of the 184,622 cases reported in 1992, 69,198 (37.6%) were caused by *P. falciparum*.

In 1992 epidemiologic studies identified three levels of risk with a view to prioritizing interventions. The high-risk level includes 130 *municipios*, with a total population of 3,279,189, which reported 96.4% of the cases (37.3% caused by *P. falciparum*) and had an API of 54.1. The medium-risk level includes 81 *municipios*, with a total of 1,869,806 inhabitants, which reported 2.8% of the cases (16.2% caused by *P. falciparum*) and had an API of 2.8. The low-risk level comprises 483 *municipios*, with a population of 18,561,789, which reported only 0.8% of the cases (17.3% caused by *P. falciparum*) and had an API of 0.1.

The highest rates of malaria transmission occur in the *municipios* along the Pacific coast, in the Amazon region, around the Gulf of Urabá in the department of Antioquia, and in the lower Cauca region. The latter region has the highest number of cases—67,640 (36.8% of the national total). Together, the Cauca and the Urabá regions account for almost half the cases.

Dengue. This disease has become endemic throughout Colombia. The country had been declared free of the vector, *Aedes aegypti*, in 1967, but this mosquito is now distributed throughout the national territory. The first confirmed case of hemorrhagic dengue occurred in 1989; there were 31 confirmed cases in 1990, 100 in 1991, and 493 in 1992. The Ministry of Health reported the occurrence of 17,970 cases of classical dengue in 1992, based on clinical diagnosis without laboratory confirmation. In 1990–1991 serotypes 1 and 4 were isolated, and in 1992, type 2.

Yellow Fever. Transmission of the jungle form of yellow fever continues to be a threat. Seventeen cases were reported in 1987 (the highest number since 1979), six cases in 1990, three in 1991, and three in 1992.

Leishmaniasis. In 1990 there were 3,940 reported cases of leishmaniasis (compared to 1,701 in 1985). During the period 1985–1990, 255 cases of visceral leishmaniasis were notified, 80% of them in children under 5 years of age.

Chagas' Disease. An estimated 3 million people live in the area in which this disease is endemic; an estimated 990,000 of them are seropositive and some 130,500 have electrocardiographic irregularities com-

patible with the disease. Serologic studies carried out in blood banks between 1987 and 1990 found Chagas' seropositivity levels of 5.5% to 7.9%. The highest transmission indices are in the eastern portion of the country. One study to measure the presence of triatomine bugs in 826,160 households found infestation rates of up to 31.2% in the most heavily affected departments. *Rhodnius prolixus* was found in 95.4% of the infested households.

Vaccine-preventable Diseases

Poliomyelitis. Between 1987 and 1991 only minor outbreaks of poliomyelitis occurred. The predominant serotype was poliovirus 1, although types 2 and 3 were also in circulation. Among children under 1 year, vaccine coverage levels in 1988–1992 were 86.0%, 90.1%, 92.8%, 91.0%, and 83.2%, respectively. The last outbreak occurred in 1990 and lasted until 1991, producing a total of 12 cases. Seven (58%) of those affected had not been fully immunized, and the other five (42%) had received three or four doses. All the cases occurred in the Atlantic coastal region and were caused by serotype 1. Vaccination coverage was under 60.0% in the affected areas, as compared with the estimated national level of 92.8%. The last isolation of wild poliovirus was in May 1991.

Neonatal Tetanus. Neonatal tetanus is a serious public health problem in Colombia. It is estimated that the health services detect only about 10% of the cases; on that basis, about 1,500 cases would have occurred in 1991 (with a case-fatality rate of 75%). Urban areas account for 67% of the cases, and rural areas, 33%. Following the identification of risk areas by several studies, a program was implemented to vaccinate 100% of the women of childbearing age living in these areas with tetanus toxoid. By 1993, 30% of the *municipios* targeted by the program were reporting fewer cases (0.5 cases per *municipio* in 1992, down from an average of 3 cases in 1986–1989), and the number of *municipios* reporting no cases had increased.

Measles. During the last decade outbreaks of measles have become less frequent and less severe. The number of cases in persons over 5 years of age has increased (although the highest rates continue to occur among children under 1 and preschoolers), but mortality from measles has declined markedly. Nevertheless, of the vaccine-preventable diseases measles continues to be the leading cause of morbidity and mortality. In 1991 there were 9,940 reported cases.

Acute Diarrheal Disease and Cholera

Acute Diarrhea. Morbidity from this disease has risen slightly among children aged 1–4 years (the most affected group), while cases in children under 1 year have decreased. In 1987, 360,000 new cases were recorded and in 1991, 460,000 (“new case” being defined as a separate episode that occurs at least 7 days after the previous episode). Among children aged 1–4 the number of cases rose from 160,000 in 1987 to 240,000 in 1991. There has been a marked decrease in the number of hospitalizations from this cause among all age groups, but especially among children under 1 year, although hospital discharges among this group increased somewhat between 1989 and 1991. In 1981, acute diarrhea accounted for 30% of all hospital discharges in the under-1-year age group; by 1990 this figure had fallen to 15%. A notable decline in mortality from this cause has also been observed, especially since 1984. An evaluation of profiles for 1989–1990 revealed that morbidity from acute diarrheal disease in children under 5 years was high (more than 298 doctor visits per 1,000 children under 5, the 50th percentile number for the year) or very high (more than 405 visits, the figure at the 75th percentile) in the Atlantic, Orinoco, and Amazon regions and in the departments of Cauca (Pacific region), Caldas, and Norte de Santander (Andean region). In these areas the mortality rate from diarrheal disease in children under 1 year was more than 1.65 per 1,000 live births.

Cholera. The cholera epidemic struck the southwestern portion of Colombia (department of Nariño) in 1991. It has since spread to all parts of the country, but has affected mainly the Pacific and Atlantic coastal areas. A total of 16,800 cases were notified in 1991 and 13,287 in 1992, with incidence rates of 0.56 and 0.44 per 1,000, respectively. As of week 20 of 1993, 257 cases had been reported, signaling a marked decrease in incidence of the disease. In 1991 the most heavily affected departments were Chocó, with an incidence of 5.6 per 1,000; Nariño, with 3.9 per 1,000; and Cauca, with 2.3 per 1,000. In 1992 the departments of San Andrés and Guajira were hardest hit (10.2 and 4.8 per 1,000, respectively). Of the 257 cases reported in 1993, 90% occurred in the departments of Nariño, Guajira, and Chocó. In 1991, 291 deaths from cholera were recorded (case-fatality of 1.7%) and in 1992, 170 (1.3%). The majority of those who died were not treated in hospitals (98%) and lived in inaccessible areas, especially as members of indigenous groups.

Chronic Communicable Diseases

Tuberculosis. Between 1987 and 1991 the incidence of tuberculosis declined very slowly, but so did the number of people examined (210,886 in 1987 and 192,879 in 1992), which suggests that the search for persons with respiratory symptoms was less intense. The number of cases was 11,437 in 1987 and 10,851 in 1991. The annual incidence rates per 100,000 population for the period 1987–1991 were 37.4, 36.8, 37.3, 33.6, and 33.0, respectively. The rates are highest in the departments with the greatest proportion of indigenous population: Amazonas, Vichada, Guainía, Vaupés, Arauca, and Chocó.

Leprosy. In 1991 there were 15,930 recorded cases, 62% of which were multibacillary. Approximately half were among residents of four departments: Santander, Norte de Santander, Valle del Cauca, and Bolívar. The number of new cases diagnosed has declined slightly over the past three decades; 850 new cases were detected in 1991, with one-third of the patients showing some degree of physical impairment at the time of diagnosis.

Acute Respiratory Infections. These diseases continue to be a leading cause of morbidity and mortality among children under 5 years and the elderly. Among children a decrease in mortality was noted between 1987 and 1990 (rates of 654.1 and 515.6 per 100,000, respectively), while among the elderly mortality increased during the same period (from 1,487.7 to 1,660.7 per 100,000).

Rabies, Foot-and-Mouth Disease, and Other Zoonoses

Rabies. Between 1987 and 1991 a change was observed in this disease’s pattern of occurrence. Rabies cases have recently been reported primarily in periurban areas or rural areas of small *municipios* (urban areas accounted for 90% of the cases in 1982, but only 20% in 1991). The regions with the highest number of cases are the Atlantic (26% of the human and 51% of the canine cases) and the Orinoco (24% of the human and 28% of the canine cases). An annual average of 23 cases of human rabies occurred during the period 1980–1984; that number decreased to 10 in 1985–1987, rose to 14.5 in 1988–1989, and then declined to 8.5 cases per year for 1990–1991. Only five cases occurred in the latter year.

Foot-and-Mouth Disease. Between 1987 and 1991 the occurrence of foot-and-mouth disease was gener-

ally endemic. The central and Atlantic coastal areas were most affected. In recent years the practice of joint management of the vaccination process has been consolidated, with active participation by committees of livestock owners.

AIDS

The first case of AIDS in the country was recorded in 1983. As of 30 October 1992 a total of 3,067 cases had been reported to the Ministry of Health. Between 1985 and 1991 the incidence of the disease increased from 0.054 per 100,000 to 2.38. Sexual transmission accounted for 69.9% of all cases, perinatal transmission for 2.2%, and transmission by blood for 1.4%; the means of transmission was not known for 26.5% of the cases. As for the population groups affected, 43% of the cases with known sexual transmission occurred in homosexuals, 28% in heterosexuals, and 27% in bisexuals. The proportion of cases in persons with a history of homosexual behavior has been decreasing (68.7% in 1985 compared to 22.1% in 1992), while the proportion in persons with a history of bisexual behavior has been rising (from 6.2% in 1985 to 17.3% in 1992).

AIDS occurs most frequently among men aged 30–34 (rate of 5.96 per 100,000) and women aged 35–39 (0.36 per 100,000). The male-female ratio has changed from 15:1 in 1983 to 11:1 in 1992.

The average annual rates are higher in the central part of the country (1.47 per 100,000) than in either the Atlantic region (0.35) or the Pacific region (0.64). The annual incidence has tended to increase proportionally more in the department of Antioquia and in the large cities, such as Bogotá, Medellín, Cali, and Bucaramanga.

Mortality from AIDS hit a high point in 1991 (1.14 per 100,000), and then decreased in 1992 (0.59 per 100,000). This apparent decline may have been the result of reporting problems.

In 1988, 61.7% of all units of donated blood were analyzed. By 1992 this percentage had risen to 94.8%. During the period 1989–1992, 810,563 (91.8%) out of 882,061 units of blood were screened. The positivity rate for HIV was found to be 0.9 per 1,000.

Nutritional Deficiencies

Between 1965 and 1989 the Ministry of Health carried out three representative and comparable national surveys to assess nutritional status among children. The total prevalence of malnutrition (weight for age)

among children under 5 years of age decreased from 21.1% to 10.1% during that period. The highest prevalence of acute malnutrition was found in the group aged 12–23 months, with the three surveys showing values of 24.5%, 23.9%, and 16.2%. During the same period the prevalence of chronic malnutrition (height for age) declined 48%, from 31.9% to 16.6%. Malnutrition as measured by weight for age decreased more in rural than in urban areas, thus tending to narrow the previously existing gap between rural and urban localities. The reduction in the prevalence of growth retardation was proportionately greater in urban areas.

Violence

Mortality from homicide increased from 21.4 per 100,000 in 1973 to 37.6 in 1981, and then remained stable until 1987. Between that year and 1990 the rate doubled (72.9 per 100,000), and it continued to rise in 1992 (86.0). Since 1986 homicide has been the leading cause of death in the country. The proportion of deaths from homicide in relation to all causes of death rose from 10.2% to 15.6% in 1990. Various studies have shown that the principal victims are young men from the lower socioeconomic strata who reside in urban areas (especially in the urban peripheries).

In 1991 homicide mortality was extremely high in some departments, such as Antioquia (277.7 per 100,000) and Valle (192.2), while the rate was well under the national average in others, including Atlántico (26.8) and Magdalena (21.2). The country's three largest cities account for 64.5% of all homicides.

Other problems of violence in the country include child abuse (which takes place in 36% of Colombian households), abuse of women, and disappearances and kidnappings (1,136 kidnappings occurred in 1992, according to data from the Center for Criminal Investigations operated by the National Police). Efforts are currently under way to consolidate a national emergency services network with a view toward improving reporting, promoting epidemiologic studies, and participating with other sectors in health promotion and violence prevention activities.

Behavioral Disorders and Addictions

In 1987 the University of Antioquia carried out a national study on addictive substances and in 1992 it conducted a study on mental health and the use of psychoactive substances. The two studies are comparable

and the most important findings concern the prevalence of drug use: for marijuana the rate remained unchanged at 11%; cocaine use declined slightly, from 3.0% to 2.8%; and the use of basuco (a cocaine derivative) continued to decrease, falling from 6.0% to 3.6%.

The study also examined the use of legal psychoactive substances. An increase was noted in the prevalence of use of minor tranquilizers (60 per 1,000 in 1987 and 319 per 1,000 in 1992). The annual prevalence of cigarette smoking declined from 297 to 212 per 1,000. Consumption of alcoholic beverages also decreased, with the rate dropping from 560 to 520 per 1,000.

A study conducted by the National Ministry of Education in 16 departments found that 8% of secondary school students use addictive substances. Those used most commonly were alcohol (56.8%), cigarettes (21%), tranquilizers (6.1%), cocaine (1.8%), and basuco (1.7%).

Risk Factors

Risks in the Physical Environment

Water Supply and Excreta Disposal. Levels of drinking water coverage and quality are inadequate. In 1991, 30% of the population did not have piped water (12.9% of the urban population and 66.7% of the rural population). Only 45.8% of the population is receiving water of good quality (62.2% of the urban population and 9.1% of the rural).

In the various regions the percentages of the population with piped water and good quality water are as follows: 94.2% and 91.1%, respectively, in the District of Bogotá; 76.2% and 56.2% in the Pacific region; 68.4% and 0.3% in the Amazon region; 62.8% and 7.1% in the Orinoco region; 54.7% and 15.2% in the Atlantic region; and 30.6% and 42.5% in the Andean region. In some departments 100% of the water supplied is deficient in quality in both urban and rural areas. Some river basins and water sources have higher-than-permissible levels of contamination, and conventional means of water treatment are not available. Some 85% of the country's industries discharge their polluting effluents into inland or coastal waters.

Almost all (98%) excreta are discharged into bodies of water without any prior treatment. Some 44% of the population lacks excreta disposal services. In urban areas, 43.8% of the population has sewerage connections and 3.4% relies on latrines or septic tanks, but only 8.8% of the rural population has adequate excreta disposal. The problem of solid waste disposal is especially serious in urban areas. Of the 1,033 *municipios* in the country, only 36 have companies that specialize in

solid waste disposal. In the 25 largest cities, refuse collection services cover 87% of the population. In 10 cities solid waste is placed in sanitary landfills; in 3 cities it is partially buried; and in the rest it is dumped at open-air sites. Efforts have been made to implement recycling procedures, and 44 organizations have been identified for this purpose.

Pollution of the Air and Atmosphere. In 1989, the last year for which information is available, the contaminants emitted by fixed sources (industry) were mainly particulate material (70%), followed by sulfur dioxide (20.6%), hydrocarbons (6.1%), and oxides of nitrogen (3.3%). The cement, brick, paper, iron, steel, and food industries were the greatest contributors to air pollution. The fuel most responsible for air pollution is coal, which generates 80% of the particles emitted into the atmosphere.

Of the emissions produced by mobile sources (motor vehicles) in 1989, 89% were carbon monoxide, 5.5% hydrocarbons, 0.5% particulate material, and 0.2% sulfur dioxide. Although an attempt is being made to gradually reduce the use of tetraethyl lead in the manufacture of gasoline, atmospheric lead continues to be a significant risk in large cities.

Noise is an increasingly serious problem. In residential zones in industrial areas of some cities the level is over 70 decibels, with maximum daily averages of 78.5 and extreme peaks of 95.

Atmospheric pollution mainly affects the five major urban areas in the country. The existing pollution control system has deteriorated.

Soil Contamination. Degraded soil quality has been the result of inappropriate agricultural policy and improper farming methods. The most frequent problems are erosion, sedimentation, salinity, and compaction. Erosion has occurred in almost 50% of the territory. The rate of deforestation is estimated at between 360,000 and 600,000 hectares per year. Salinity affects 10% of all the arable land, making the soil less fertile.

Industrial and Agricultural Waste. The industrial sector discharges 680,000 m³ of effluent per day into watercourses and the soil, three times more than the agricultural sector. Nevertheless, an analysis of biochemical oxygen demand (BOD) reveals that the agricultural sector generates the greatest contaminant load (7,208 million kg of BOD/day), followed by the domestic and then the industrial sectors.

Oil spills are another risk. The Caño Limón-Coveñas oil pipeline, for example, was damaged in 165 separate

incidents (guerrilla attacks) between 1986 and 1991, resulting in the spillage of 700,000 barrels. Utilization of mercury during gold panning produces tremendous environmental harm in the department of Chocó, where mercury levels 100 times higher than permissible have been recorded in fish.

Between 1978 and 1989 an annual average of 618 cases of pesticide poisoning were treated (case-fatality rate of 14%). Pesticides prohibited in other countries because of their carcinogenic effects have been detected in milk intended for human consumption at levels seven times higher than the limits recommended by FAO and WHO.

Risks in the Work Environment

According to data from the Social Security Institute, 105,468 occupational accidents were reported in 1989, 40% of which resulted in disability (1,064,930 days lost at a cost of Col\$ 1,600 million). During the same year, there were 434 fatal accidents, for a rate of 1.72 per 10,000 social security affiliates (as compared to 1.49 in 1988). Of these accidents, 39% were caused by firearms, 27% by transport vehicles, 10% by working surfaces, 3% by electrical appliances, and 3% by manual tools.

The accident rate has fallen steadily over time. The incidence registered in 1989 was one-third of that in 1971.

Emergencies and Disasters

The principal threats are floods, earthquakes, volcanic eruptions, and landslides. According to statistics from the National Disaster Prevention and Response System, in 1991 emergencies affected 22,988 persons (4,365 families) and caused 82 deaths; 190 homes were totally destroyed and 979 were damaged. The most seriously affected regions were the Pacific coastal region, the Andean region, and the eastern plains.

Contamination of Food

There is no national system for information on and epidemiologic surveillance of foodborne diseases. According to sources within some sectional health departments that operate local information systems, between 1988 and 1991 there were 260 outbreaks of these diseases, but the exact number of people affected could not be determined. Foods sold on the streets and foods prepared at home have been implicated by some stud-

ies as the principal sources of transmission. In 1991, more than 30% of street food vendors were found to be carriers of pathogenic germs and 97% of food stands had deficient sanitary conditions, including improper food handling, lack of water, insufficient heating, and lack of refrigeration.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

Health policies during the 1980s were formulated within the framework of three development plans—the National Integration Plan (1979–1982), the Plan for Change with Equity (1983–1986), and the Social Economy Plan (1987–1990)—which emphasized the need to increase coverage and make spending more effective and equitable. In all these plans, improving the situation of the most underprivileged groups is a central concern and commitment.

The emphasis of the plans has been changed through special programs, including the national vaccination days (initiated in 1984); the National Plan for Child Survival and Development, launched in 1985 and later known as *Supervivir* (“Survive”), which is aimed at children under 5 and women aged 15–44 years; and the Primary Health Care for All plan, which has sought to develop primary health care through efforts targeting specific groups or areas, such as the National Rehabilitation Plan and the Integrated Rural Development Plan.

The development plan currently in effect has been called “The Peaceful Revolution” (1990–1994). It incorporates into the policy lines mentioned above the development of health care systems supported by social security programs, subsidized demand, and criteria of equity and distribution. The objectives are to accelerate decentralization, increase community participation, extend coverage, and improve management within the sector.

In the second half of the 1980s a policy of targeted social spending was developed. This policy sought to generate new programs and strengthen those initiatives with the greatest distributive impact. This policy was applied to some 37% of all social spending. In 1988, total spending on health and education amounted to 1.5% of the GDP.

Law 12 of 1987 allocated financial resources to the *municipios*, giving them a share in sales tax revenues, in order to endow them with real decision-making power. Law 10 of 1990 made administrative and finan-

cial decentralization of the health sector mandatory and possible, through basic principles such as streamlining of hospital management, refinancing of the sector, establishment of training programs for professional administrators, encouragement of community participation, and definition of health services as a public service.

Decree 1216 of 1989 gave impetus to decentralization among communities and local authorities, creating community participation committees in health posts and centers and in hospitals. The functions of these committees are to participate in planning health services, in setting priorities, in controlling quality and costs, and in various aspects of administration. In 1991 the National Constitution of Colombia recognized and ratified social and community participation, and in 1992 the National Community Council was established as the body that brings delegates from the community participation committees together at the departmental level. However, in practice collaboration continues to be the predominant form of participation.

The general objectives of the current government in the area of environmental policy are to actively involve all the productive sectors, private enterprise, and the citizenry in the generation of human, scientific, productive, economic, legal, and operational resources that will make it possible to protect and conserve the country's natural resources so as to ensure that they will be sufficient to sustain sound economic and social growth.

The salient features of health spending during the 1980s were the following:

- Spending on health as a share of the GDP declined from 7.1% in 1980 to 6.1% in 1990.
- During depression years, private spending on professional services and hospital care tended to grow, while in periods of recovery the relative importance of spending on drugs increased. Household spending remained constant at 3.9% of the GDP.
- At the central level, the share of the total budget allocated to health decreased steadily from 1980 on.
- In absolute terms, public spending declined in the period 1980–1985, but began to rise again in 1986–1987.
- The figures on transfer of funds to the departments showed counter-cyclical behavior.
- There was a marked trend toward a decrease in the relative importance of spending on infrastructure and a concentration on personal health care services.

One of the most profound changes in the sector, rooted in the new constitution of 1991, was the reorganization of the system of health financing through the creation of the Cofinancing Fund for Social Investment. The purpose of this fund, which is administered by the National Planning Department, is to cofinance

the decentralized execution of programs and projects presented by territorial entities in the areas of health, education, culture, recreation, sports, and attention to the poorest and most vulnerable groups.

The community day-care program of the Colombian Institute for Family Welfare was launched in 1977 and initially served 1,600 children. By 1990, 48,000 day-care centers had been established and were serving 750,000 children. These centers provide daily care to children under 7 years of age. The program is financed through a 3% payroll tax. Since 1984 vaccination campaigns have been carried out in the centers on a regular basis.

The country devotes only 0.25% of the GDP to science and technology, and the ratio of research scientists to national population is also quite low. The National Science and Technology System was created and put into operation under a law enacted in 1990. Present efforts are being directed toward a review of health technologies, the definition of research priorities, the strengthening of research groups, and the updating of ethical standards for health research. Decree 1811, promulgated in 1990, regulates the delivery of health services to indigenous communities, but to date there has been insufficient development in this area.

The 5-year National Plan for Occupational Health was formulated in 1990 as the result of agreement and coordination between the ministries of Health and Labor.

Organization of Services

Personal Health Care Services

Responsibility for the delivery of health services is shared by three sectors: the public sector, which serves 65% of the population (although real coverage appears not to be any higher than 39%); the social security sector, which serves 22.4%; and the private sector, which serves 12.6%. In the latter sector, prepaid health plans have emerged as an option in recent years.

The health system also comprises the following public institutions or corporations affiliated with the Ministry of Health: (1) The National Superintendency of Health, which is responsible for inspection, monitoring, and regulation of the sector with regard to investment, appropriate use of resources, and quality of the delivery of services; (2) the National Institute of Health, which conducts and coordinates scientific research in health and biomedicine, in addition to promoting technological development and operating a reference laboratory service; (3) the Colombian Insti-

tute for Family Welfare, whose principal objective is to promote and strengthen families, while protecting and upholding the rights of minors; (4) the National Cancer Institute, which formulates plans and executes projects related to prevention and early treatment of cancer, as well as cancer research; and (5) ECOSALUD, a public corporation formed by the State and the territorial entities for the purpose of overseeing all forms of gambling and games of chance in the country and utilizing the proceeds to benefit the health sector.

In 1991 the country had 956 hospitals and 45,841 hospital beds (1.44 beds per 1,000 population). The public sector had 386 first-level hospitals, 123 second-level hospitals, and 31 third-level institutions. As for outpatient facilities, there were 123 health posts with beds, 829 health centers, and 2,970 other health posts. The institutions are distributed in such a way that everyone in the country can reach a health facility with a maximum of 2 hours travel on foot. The social security system had 39 second-level hospitals and 292 primary care centers, and the private sector had 288 hospitals and an undetermined number of outpatient establishments and physicians' offices.

With regard to outpatient visits, in 1986 there were 15,117,550 consultations in the public and semipublic sectors; the number rose to 17,991,394 in 1990. Hospital discharges for all sectors numbered 1,709,272 in 1985 and 1,683,143 in 1990. Between 1980 and 1989 the following changes were recorded: the number of doctor visits per 1,000 population increased from 657 to 672; preventive dental care coverage rose from 13.9% to 18.0%; disease control coverage fell slightly from 3.7% to 3.6%; the number of persons served by each health promoter increased from 6,014 to 6,361 (1.9%); rural coverage by health promoters rose from 59.9% to 60.2%; hospital discharges per 1,000 population went from 59.9 to 61.3; discharges per bed/year climbed from 37.8 to 40.7 (a 2.5% increase); the bed occupancy rate fell slightly from 57.4% to 57.2%; and the average hospital stay went from 5.70 to 5.75 days.

Environmental Services

The country has a variety of institutions in charge of the social response in the area of the environment. The main ones are the Ministry of Development, which is responsible for overseeing and setting standards for the water supply and sanitation subsector, and the Ministry of Health, which is responsible for monitoring the quality of drinking water systems.

In regard to the food safety program, the budget for 1991 was 10 times greater than that for 1988. Funds

have been allocated for the following activities: creation of a foodborne disease reporting system; laboratory support; development of training, education, and health promotion processes; and the revision, implementation, and monitoring of laws and standards, including those related to foreign trade.

A national department for disaster and emergency prevention and response exists under the Ministry of the Interior. Its basic function is interinstitutional coordination. Its major achievement has been to promote and support the local committees, which are the first to respond in the event of a disaster or emergency.

Available Resources

In 1991 the country had 32,116 physicians, 16,076 dentists, 9,966 nurses, 32,138 nursing auxiliaries, and 7,640 health promoters. The percentage increases in the numbers of these health workers since 1987 were the following: physicians, 28%; dentists, 26%; nurses, 34%; nursing auxiliaries, 14%; and health promoters, 23%. Health personnel tend to be concentrated in urban areas, and no consistent policy has been applied to encourage them to provide their services in traditionally underserved areas.

According to an analysis of demand for and use of health services published by the National Institute of Health in 1991, there has been a decrease in the numbers of people consulting pharmacists for medical advice (from 1% to 0.4% between 1980 and 1989) and in visits to doctors in private practice (41.5% to 30.6%). At the same time, there has been an increase in the numbers of people consulting doctors (7.6% to 9.2%) and in consultations in institutions (47.7% to 65%), as well as in births attended by physicians (47.6% to 68.4%) and in births occurring in institutions (54.6% to 72.6%). The number of hospital discharges per 100 population has remained stable at 5.2.

Use of the physical infrastructure in the public sector is uneven: the most technically advanced and costly facilities receive the heaviest use, while many primary care facilities are underutilized. Infrastructure deficiencies are therefore related not so much to a shortage of facilities as to imbalances in utilization patterns.

The public sector hospitals are currently facing a series of critical problems with regard to financing, planning, management and supervision, administrative control, and coordination between sectoral entities. In order to address these problems, the Ministry of Health is applying various measures and programs aimed at improving management in these institutions through training and institutional regulation.

COSTA RICA

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

Health conditions in Costa Rica have improved markedly since the 1970s. As a result of the successes achieved in combating infectious diseases, chronic and degenerative diseases have emerged as the predominant causes of mortality and morbidity, although the diseases characteristic of underdevelopment continue to exist in the country.

The 1970s saw a reduction in the inequalities among the different regions of the country in terms of health and social welfare. Little progress was made in this regard during the 1980s, although the traditional health indicators did not decline. Nevertheless, toward the end of the decade several changes occurred which, while not reflected in any general worsening of national health indicators, did reveal the fact that some regions and population groups were lagging behind the rest of the country.

The living conditions of the population deteriorated substantially during the 1980s, owing to the economic crisis that began in 1981–1982. During that period, inflation climbed to 81%, the value of the country's currency declined 320%, the GDP fell 10% in 2 years, and per capita income decreased 21%. The unemployment rate doubled, reaching 9.4%, and underemployment rose to 14.4%. At the same time, the purchasing power of wages dropped by 40%. Between 1983 and 1985 economic production was rekindled and the economy grew at a rate of close to 4% per year, which helped create jobs and restore purchasing power. Between 1986 and 1989 open unemployment decreased to 5.3%. The GDP grew 5.5% in 1986, 5.4% in 1987, 3.8% in 1988, 2.3% in 1991, and 7.3% in 1992. In 1991 the Economic Commission for Latin America and the Caribbean reported that 24.4% of Costa Rican families lived in poverty and unemployment was 5.1%.

According to data from a household survey conducted in 1992, the national rate of open unemployment was 4.1%, while the underemployment rate was

20.9%. However, in the Pacific Central and Huetar Atlántica regions (the former includes part of the province of Puntarenas and the latter encompasses the province of Limón) unemployment rates of 5.2% and 8.2%, respectively, were reported. Poverty levels also varied by region: in the Central region (comprising San José, Cartago, Heredia Centro, and Alajuela Centro) 17% of families were poor, while in the regions of Choroteaga (province of Guanacaste), Brunca (San Isidro del General and the southern portion of Puntarenas), and Huetar Norte (northern portion of the provinces of Alajuela and Heredia), the proportions of poor families were 42%, 40%, and 32%, respectively. Overall, it is estimated that 120,842 Costa Rican families live in poverty. In 1985, 20% of salaried workers were not earning enough to cover the cost of the basic food basket; by 1991 this proportion had risen to 30%.

According to the 1984 census, 6.9% of the population was illiterate. In 1990 the proportion of children who had not attended at least primary school was 0.2%. The Central region has more resources for education than the rural areas, in which one-room schools predominate. School attendance is compulsory through ninth grade. Between 1985 and 1988 the dropout rate was 24%, and the grade repetition rate among primary school enrollees was 11%. The proportion of the national budget devoted to education fell from 26.7% in 1970 to 20.6% in 1992. Of the public school students who took the examination for a secondary school diploma, only 53% passed, compared with 85% of private school students.

In 1990 the demand for new housing was estimated at 30,000 units. In 1989 there were a total of 604,726 housing units in the country, 64% of which were located in the Central region. The proportion of housing units in fair or poor condition is estimated at 31.7%, and more than 75% of those in poor condition are located in rural areas. Countrywide, 18.4% of dwellings lack electricity; in the Central region the proportion is 5.4%, while in the rest of the country it ranges from 26% to 56%.

Some 92.4% of the population is served by a water supply system, although only 81% receives chlorine-treated water. In urban areas 97% of homes are sup-

plied with water and in rural areas, 86%. Only 39.2% of urban wastewater is disposed of in sanitary sewers, while the remaining 60.8% goes into septic tanks and latrines. The country has very few water treatment plants and only five stabilization ponds, located in outlying areas.

Population

In 1987 Costa Rica had 2,790,600 inhabitants. Based on official projections, the 1992 population was estimated at 3,099,063, with an age structure as follows: 0–4 years of age, 12.8%; 5–14 years, 23.1%; 15–64 years, 59.8%; 65 years or older, 4.3%. The population density increased from 50 inhabitants per km² in 1984 to 60.7 in 1992. The Central region is home to 65% of the population, with a density of 230.1 inhabitants per km²; in other regions of the country the population density ranges from 19 to 40 inhabitants per km². The population is 47% urban and 53% rural. Between 1960 and 1990 the urban population grew at an average annual rate of 3.9%.

The growth of the Central region has been largely the result of internal migration, although international migration has also played a part, particularly during the period 1975–1985, when three regions of the country registered net immigration (Central, Huetar Norte, and Huetar Atlántica). There continue to be two main currents of migration: from small cities and rural areas to the country's principal urban centers, and from economically depressed rural areas where employment opportunities are limited and most of the land is owned by a few individuals to other rural areas in which development is taking place and the demand for workers is greater.

In 1989, 40,800 refugees were living in the country. By July 1993, the number had fallen to 31,875. In addition, there are an estimated 250,000 undocumented aliens.

The natural population growth rate for the period 1991–1992 was 2.26%. The total fertility rate decreased from 3.5 children per woman between 1980 and 1985 to 3.26 between 1985 and 1990. In 1991 the birth rate was 26.3 per 1,000 population, and life expectancy at birth for the period 1990–1995 was estimated at 75.2 years.

Mortality

Birth and death records suffer from late registration of mortality, which is estimated at 2.8% for general

mortality and 3% for infant mortality. No medical death certificate is issued for 24% of deaths in general, whereas only 2.8% of infant deaths lack medical certification.

The general mortality rate recorded in 1991 was 3.8 per 1,000 population and there were a total of 11,792 deaths. The infant mortality rate in 1991 was 13.9 per 1,000 live births. Deaths attributed to signs, symptoms, and ill-defined conditions made up 1.7% of the total.

In 1991 four major groups of causes accounted for 70% of all deaths: 29.4% were due to diseases of the circulatory system (ICD-9, 390–459), 20% to malignant neoplasms (140–239), 10.5% to external causes (E800–E999), and 10.2% to diseases of the respiratory system (460–519), with rates of 11.2, 7.6, 4.0, and 3.9 per 10,000 population, respectively. Infectious and parasitic diseases, which in 1970 ranked as the leading cause of death and accounted for 20.5% of all deaths (a mortality rate of 13.6 per 10,000 population), in 1991 ranked 10th and were responsible for 2.8% of all deaths (a rate of 1.1 per 10,000 population).

Among the general population in 1991 acute myocardial infarction (ICD-9, 410) was the leading cause of death, accounting for 9.6% of all deaths. The mortality rate from this cause increased from 2.6 per 10,000 population in 1970 to 3.7 in 1991. In second place was malignant neoplasm of the stomach (151), which caused 5% of all deaths. The mortality rate from this cause, 2.0 per 10,000 population, has changed very little since 1970. The third leading cause of death was other forms of chronic ischemic heart disease (414), at a rate of 1.6. Chronic airway obstruction (496) ranked fourth, at a rate of 1.2, and acute cerebrovascular disease (436) and diabetes mellitus (250) ranked fifth and sixth, respectively, at rates of 1.2 and 1.0 per 10,000 population.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

The decline in infant mortality between 1970 and 1980 (from 61.5 to 19.1 per 1,000 live births) slowed between 1980 and 1985, when the rate was 17.6 per 1,000. In 1991 the rate recorded was 13.9 per 1,000 live births. The neonatal mortality rate fell from 25.2 per 1,000 live births in 1970 to 11.2 in 1980 and 8.6 in 1991. Similarly, the postneonatal mortality rate decreased from 36.3 per 1,000 live births in 1970 to 7.9 in 1980 and 5.2 in 1991. The perinatal mortality rate, which in 1975 was

23.7 per 1,000 live births, declined to 12.1 per 1,000 in 1991. The highest infant mortality rate registered in any of the country's cantons in 1991 was 31.4 per 1,000 live births, and the lowest was 2.7 per 1,000.

Children under 1 year of age accounted for 9.5% of all deaths in 1991. The leading causes of death in this age group changed between 1970 and 1991. Intestinal infectious diseases (ICD-9, 001-009) moved from first to seventh place, the rate declining from 16.7 to 0.4 per 1,000 live births. In 1991 conditions originating in the perinatal period (760-779), congenital anomalies (740-759), and diseases of the respiratory system (460-519) were the three leading causes of death in this age group, with rates of 6.1, 3.9, and 1.5 per 1,000 live births, respectively.

In 1990 the leading causes for outpatient medical visits among children under 1 year, in descending order, were bronchitis (10%), well-child visits (8%), acute respiratory infections (6%), acute tonsillitis (6%), and infections of the skin and subcutaneous tissue (5.5%). In 1990, data on hospital discharges from institutions of the Costa Rican Social Security Fund (CCSS) show that the leading causes of hospitalization in this age group were conditions originating in the perinatal period (39.3%—a proportion equal to 3.5% of all discharges), intestinal infectious diseases (12.5%), pneumonia (7%), and congenital anomalies (6.5%).

The proportion of children with low birthweight (under 2,500 g) has remained at around 6.7% since 1988.

Breast-feeding increased between 1975, when 85.3% of infants were breast-fed from birth, and 1990, when 93.9% were breast-fed. The proportion of children exclusively breast-fed for 3 months increased from 16.7% to 47.9% between 1975 and 1990, while the proportion exclusively breast-fed for 6 months increased from 11.2% to 21.7%.

The mortality rate among children aged 1-4 years decreased from 51.1 per 10,000 in 1970 to 10.1 in 1980 and 6.5 in 1991. In the latter year, 1.8% of all deaths occurred in this age group. Between 1970 and 1991 infectious and parasitic diseases dropped from first to fourth place among the leading causes of death in this age group, with the rate falling from 25.9 per 10,000 in 1970 to 0.9 in 1991. Congenital anomalies (740-759) ranked as the leading cause of death in 1991, followed, in descending order, by external causes (E800-E999) and diseases of the respiratory system (460-519). The five leading causes of doctor visits were acute tonsillitis, bronchitis, nasopharyngitis and sinusitis, anemia, and asthma. In 1990 this age group accounted for 5% of all hospital discharges, with intestinal infections

being the most frequent cause of hospitalization (18.2%), followed by bronchial asthma, pneumonia, and other respiratory infections, and by congenital anomalies.

Based on the indicator weight-for-height, in 1991 the reported prevalence of mild malnutrition among children under 6 years of age, was 17.9%, that of moderate malnutrition was 2.4%, and that of severe malnutrition was 0.1%. The prevalence of overweight was 2% among children under 1 year, 1.7% among children aged 1-2, and 1.7% among those aged 3-5.

The age group 5-9 years accounted for 0.8% of total mortality in 1991. External causes (E800-E999) were the leading cause of death, followed by malignant neoplasms (140-239), diseases of the nervous system and sensory organs (320-389), infectious and parasitic diseases (001-139), and endocrine and metabolic diseases and immunity disorders (240-279). The causes for outpatient medical visits in this age group were similar to those for the group aged 1-4 years. Hospital discharges in this group made up 3.4% of all discharges. The leading causes of hospitalization were acute respiratory infections and bronchial asthma (14.4%), appendicitis (6.6%), congenital anomalies (5.2%), and intestinal infections (5%).

Adolescent and Adult Health

In 1991 young people aged 10-19 made up 20.4% of the population and those aged 20-24 constituted 9.4%; thus, almost one-third of the national population was between 10 and 24 years of age. According to 1984 census data, 15.9% of the economically active population was composed of young people aged 15-19. The 1989 household survey showed that 24% of the adolescent population was employed.

In 1991, deaths in the age group 10-14 years accounted for 0.8% of total mortality, deaths in the group 15-19 for 1.2%, and deaths in the group 20-24 for 1.7%. The leading cause of death among persons 10-14 years of age was external causes (E800-E999), with a rate of 1.4 per 10,000 population; accidental drowning and submersion (E910) and transport accidents (E800-E848) were the predominant external causes. The second leading cause of death was diseases of the nervous system and sensory organs (320-389), with a rate of 0.62 per 10,000 population, the principal ones being, in descending order, infantile cerebral palsy (343), other brain disorders (348), and epilepsy (345). Malignant neoplasms (140-239) ranked third, with a rate of 0.22 per 10,000 population.

Mortality in the group aged 15–24 accounted for 2.9% of total mortality. Two-thirds of the deaths in this group were of males, and the leading cause was external causes (E800–E999), mainly transport accidents of all types.

In regard to morbidity, 10.5% of all doctor visits at CCSS institutions (close to 6 million) and 11% of all hospital discharges in 1987 involved persons aged 10–19. The leading reasons for consultations were prenatal care (6%), acute tonsillitis (4.9%), and pharyngitis-nasopharyngitis (4.7%). Among males, the most common reasons were infections of the skin and subcutaneous tissue (13.2%); sinusitis, laryngopharyngitis, and acute tonsillitis (10.1%); and "other" parasitic diseases (5%). Among females they were nasopharyngitis and sinusitis (8.9%); prenatal care (6.7%); and infections of the skin and subcutaneous tissue (6%).

The leading causes associated with hospital discharge in the group 10–19 years of age in 1990 were direct obstetric causes (27%), normal delivery (21.2%), and appendicitis (4.5%) for females, and appendicitis (10%), wounds and injury to blood vessels (7.9%), and intracranial and internal injuries (6.4%) for males.

In 1991, 16.2% of all live births (81,110) were to mothers under 20 years of age. Complications of pregnancy, childbirth, and the puerperium accounted for 71.3% of hospital discharges among the female adolescent population.

Mortality among the population aged 15–49 accounted for 16.2% of total mortality in 1991 (1,922 deaths). The leading cause was the group of external causes (E800–E999), which accounted for 36% of the deaths, or a rate of 4.3 per 10,000 population (down from the rate of 6.3 reported in 1980). Malignant neoplasms (140–239) ranked second, causing 19.2% of the deaths, with a rate of 2.3. In third place were diseases of the circulatory system (390–459), which accounted for 14.3% (a rate of 1.7 per 10,000 population). Of the total number of deaths, 65% were of males, among whom violent causes, including both accidents and suicide, predominated.

In 1991 persons aged 50 years and over accounted for 71% (8,136) of all deaths. Over three-quarters of these deaths (77.7%) were due to four groups of causes. The leading cause, accounting for 36% of all deaths in this group, was diseases of the circulatory system (390–459), with a rate of 83.2 per 10,000, and of these diseases acute myocardial infarction (410) was the most important (29%). The second leading cause, with a rate of 51.0 per 10,000, was malignant neoplasms (140–239), which accounted for 23% of the

deaths; malignant neoplasm of the stomach (151) was the predominant cause in this group. Diseases of the respiratory system (460–519), with a rate of 25.7 per 10,000, ranked third, accounting for 11.7% of the deaths; chronic obstructive pulmonary disease (490–496) and bronchopneumonia (485) predominated in this group. In fourth place were external causes (E800–E999), which accounted for 5% of all the deaths in this age group and had a rate of 11.3 per 10,000.

Persons 20–59 years of age made 51.3% of all outpatient visits to CCSS institutions. Of these visits, 70% involved persons aged 20–44 and 71% were visits made by women of childbearing age. According to a survey carried out in 1987, the primary causes for outpatient visits in this age group were diseases of the skin and subcutaneous tissue (88%), upper and lower back problems (6.7%), and gastroduodenitis (5%) among males, and hypertensive disease (6.2%), prenatal care (6.1%), and neurotic disorders (4.1%) among females. Hospital discharge records for 1990 indicate that the 20–59 age group accounted for 58.7% of all discharges from CCSS institutions; of these discharges, 76% were of women aged 20–44. Direct obstetric causes were the leading cause of hospitalization among females (34.4%), followed by normal delivery (19.8%), and abortion (5%). Among the male population, the leading causes were psychoses and neurotic disorders (5.8%), osteomuscular diseases (5.3%), and intracranial and internal injury (5.1%).

Health of Women

In 1991 females made up an estimated 49% of the total population; 24% were under 10 years of age, 21.2% were 10–19, 38.4% were 20–44, 9.8% were 45–59, and 6.9% were 60 or older.

Regarding leading causes of death in the female population, cardiovascular diseases (ICD-9, 390–459) account for 30.6% of all female deaths, malignant neoplasms (140–239) for 20.2%, diseases of the respiratory system (450–519) for 12.1%, and external causes (E800–E999) for 5.6%. The most frequent sites of malignant neoplasms are the stomach (151), uterine cervix (180), and breast (174). The contributions of these three types of cancer to total female deaths are 19.4%, 11.3%, and 9.4%, respectively, and the corresponding mortality rates are 13.8, 8.1, and 6.7 per 100,000 females. As with males, the leading external cause among females was transport accidents (E800–E848), which accounted for 30.9%, followed by accidental falls (E880–E888), especially among elderly women.

Females made 63.4% of the outpatient visits to CCSS establishments, with women aged 20–44 accounting for 58%. The most frequent reasons for seeking medical care among females aged 20–59 were pregnancy-related causes, hypertensive disease (6.2%), neurotic disorders (4.1%), and upper and lower back problems (3.7%). Females accounted for 69% of all hospital discharges in 1990; of those discharges, 68% were of women aged 20–59. Direct obstetric causes, normal delivery, and abortion together accounted for 59% of the discharges among women in this age group, and other diseases of the female genital organs accounted for 3.8%. Diabetes mellitus, disorders of the eye, ischemic heart disease, respiratory diseases, and hypertensive disease together were responsible for 30% of hospitalizations in women aged 60 and over.

In 1991 a total of 89,221 pregnancies (80% low-risk and 20% high-risk) and 81,110 live births were recorded. Of these births, 16.2% were to women under the age of 20, 73% were to women 20–35, and 10.7% were to women over 35. Overall, 38% of the total number of births were to single mothers, with considerably higher proportions in the provinces of Guanacaste, Puntarenas, and Limón (60.7%, 53%, and 60%, respectively); 65% of all live births among adolescent women were to single mothers.

In 1991, 96% of all births took place in hospitals, and 95% were attended by a physician or an obstetric nurse; 20% of all births were by cesarean section. Only 55% of the women giving birth in hospitals had received prenatal care. In 1990 the number of prenatal visits per birth averaged 2.4. Maternal mortality declined from 7.0 (41 deaths) to 3.5 (28 deaths) per 10,000 live births between 1975 and 1990. The leading causes of maternal death were hemorrhage, infections, and toxemia of pregnancy.

Rape, incest, sexual abuse, and other types of physical aggression are important problems for women. According to information for 1993, every day 60 complaints of domestic violence are lodged with the Office of the Public Defender for Women and the Program for Abused Women. This number is undoubtedly an underestimate of the problem, since most cases of abuse are not reported. A study carried out in 1993 found that an estimated 77.8% of women had been victims of some type of violent conduct by their male partners. According to the Office of Women's Affairs, the majority of the 14 rapes reported on average every day, involve adolescents aged 11–16, and 90% of the pregnancies occurring among girls under 14 are the result of sexual abuse, generally committed by a close relative.

Health of the Elderly

In 1991 persons aged 60 and over made up 6.4% of the population, up from 5.5% in 1980. Of all the deaths that year, 62% were of persons in this age group, and most (74%) of those deaths were due to three causes: diseases of the circulatory system (ICD-9, 390–459), which accounted for 39% (a rate of 143.6 per 10,000 population); malignant neoplasms (140–239), which accounted for 22% (81.2 per 10,000 population); and diseases of the respiratory system (460–519), which accounted for 13% (46.3 per 10,000 population).

This age group accounted for 14.1% of the outpatient visits to CCSS institutions and 12.5% of the discharges from CCSS hospitals. Among females 60 years and over, the three leading causes of outpatient visits were hypertensive disease (18.4%), diabetes mellitus (8.1%), and arthropathies and related disorders (5.8%). Among males in the age group, these causes accounted for 15.4%, 5.9%, and 5.1%, respectively, of outpatient visits. Neurotic disorders were the fourth leading cause for outpatient visits among women (3.6%) and the seventh leading cause among men (2.8%). The three principal causes associated with hospital discharge in 1990 for both sexes were ischemic heart disease (7.2%), diseases of the eye, ear, and mastoid process (5.9%), and diabetes mellitus (5.8%). Ischemic heart disease ranked first among men (8.4%) and third among women (6%), while diabetes mellitus was the leading cause among women (7.5%) and ranked seventh among men (4%). Diseases of the eye, ear, and mastoid process ranked second among women (6.4%) and third among men (5.5%). Diseases of the male genital organs were the second leading cause associated with hospital discharge among elderly men (7.4%).

A study of morbidity carried out in the canton of Coronado in 1986 and 1987 found the most prevalent chronic diseases to be osteomuscular and joint diseases (49.1%), followed by arterial hypertension (38.4%), diabetes mellitus (13.9%), cerebrovascular accident (6.7%), and malignant neoplasms (4.5%).

Workers' Health

The work force in 1990 totaled 1,017,151 persons—38% of the total population. Only 573,321 employed persons (56%) had insurance coverage for work-related accidents and diseases, although by law all workers must be covered. That same year there was an average of 10,357 occupational accidents per month, or 345 per day.

According to a report by the National Insurance Institute (INS), the four leading types of work-related accidents in 1990 were accidental falls (21.6%); accidents caused by submersion, suffocation, and foreign bodies (5.3%); accidental poisoning by solid or liquid substances (4.7%); and transport accidents (2.7%).

Diseases and Health Impairments

Vector-borne Diseases

In 1975 a total of 304 cases of malaria were reported, for a rate of 1.5 per 10,000 population. Between 1980 and 1985 the number of cases rose from 368 to 722, while the rate increased from 1.6 to 2.7 per 10,000 population. In 1990 the number of reported cases totaled 1,142 (a rate of 3.8 per 10,000), and in 1991, 3,247 cases (a rate of 10.5). Seventy-four percent of the cases occurred in the Huetar Atlántica region (province of Limón). In 1992 there were 6,951 cases (22.5 per 10,000 population). Of that total, 1,173 (16.9%) occurred in foreigners and 5,210 were detected in the province of Limón, which experienced considerable immigration in connection with the growth of the banana industry in the area. In addition, ecological changes in the province as a result of banana-growing—deforestation and flooding of large areas—created favorable conditions for proliferation of the vector.

Vaccine-preventable Diseases

The last six cases of diphtheria in the country were reported in 1975. No cases of poliomyelitis have been reported since 1973. Tetanus cases decreased from 46 in 1975 to just 2 in 1992 (rates of 2 and 0.1 per 100,000, respectively, in those years). A total of 1,165 cases of whooping cough were reported in 1975 (a rate of 5.9 per 10,000) and 29 in 1992 (a rate of 0.1 per 10,000). Costa Rica continued to experience cyclical outbreaks of measles, and an epidemic in 1979–1980 resulted in 7,883 cases and 42 deaths, for a case-fatality rate of 5.3 per 1,000. An outbreak in 1986–1987 was responsible for 8,457 cases and 16 deaths, making the case-fatality rate 1.9 per 1,000. During the period 1988–1990 there were only 467 cases and no deaths. However, in 1991–1992 another epidemic produced 8,701 cases and a case-fatality rate of 6 per 1,000 (54 deaths); 60% of those deaths were of persons under 1 or over 19 years of age.

Cholera and Other Intestinal Infectious Diseases

The first case of cholera in the country was detected in 1992, and as of April 1993 a total of 16 cases had been reported, 9 of which were imported. Mortality from diarrheal diseases has decreased among both children and adults. In 1970 these diseases were the leading cause of death, accounting for 10.5% of all deaths, with a mortality rate of 7.0 per 10,000. By 1991 they had dropped to 22nd place and accounted for only 0.9% of deaths, with a rate of 0.4 per 10,000. As a cause of infant death, diarrheal diseases moved from first place in 1970, when they accounted for 27% of all infant deaths (rate of 16.7 per 1,000 live births), to seventh place in 1991, when they accounted for 3% of all infant deaths (rate of 0.4 per 1,000 live births).

In 1990 intestinal infectious diseases accounted for 3% of all discharges from CCSS hospitals. According to Ministry of Health records on notifiable diseases, in 1991 a total of 68,887 cases of diarrheal disease were reported, yielding a rate of 2,231 per 100,000 population.

The incidence rate of hepatitis (all types) has declined steadily, from 95.0 per 100,000 population in 1985 to 85.1 in 1990 and 39.7 in 1991. Nevertheless, outbreaks of hepatitis A continue to occur in small communities in which fecal contamination of water has been confirmed.

Chronic Communicable Diseases

Fifty cases of tuberculosis (all forms) were reported in 1990, (a rate of 1.6 per 100,000 population), and 201 in 1991 (6.5 per 100,000). By comparison, in 1980 and 1985 the rates had been 20.5 and 13.9 per 100,000 population, respectively.

The number of cases of leprosy has declined. In 1980 there were 47 reported cases and the rate was 2.1 per 100,000 population, while the rates in 1985 and 1991 fell to 1.1 and 0.5 per 100,000 population, respectively.

Respiratory Diseases

In 1991 respiratory diseases were the fourth leading cause of death overall, accounting for 10% of total mortality, with a rate of 3.9 per 10,000 population. Among the population aged 50 years and over, these diseases were the third leading cause of death, with a rate of 25.7 per 10,000 population. The most important of these diseases in 1991 were chronic obstructive pulmonary disease and bronchopneumonia. Mortality from respira-

tory diseases has decreased substantially, especially among children under 1 year. In that group bronchopneumonia ranked fourth as a cause of death in 1991 (rate of 0.6 per 1,000 live births), whereas in 1970 it had ranked second (rate of 6.9 per 1,000 live births).

A national survey of outpatient visits found that in 1987 acute respiratory infections and other respiratory diseases were the leading causes of outpatient visits to CCSS institutions, accounting for 17.8%, and in 1989 they were the diagnosis associated with 7.6% of all hospital discharges among children under 10 years of age. Bronchitis is second only to acute tonsillitis as a reason for outpatient visits among children aged 1–4.

AIDS and Other Sexually Transmitted Diseases

As of December 1992, 433 cases of AIDS had been reported: 57.5% in homosexuals, 15.2% in bisexuals, and 8.5% in heterosexuals. Of all the reported cases, 86.8% had occurred in persons 20–49 years of age, and 7% (32 cases) were in females. Seven cases resulting from perinatal transmission have been reported since 1988.

The rates of gonorrhea reported by the Ministry of Health were 380.8 and 313.6 per 100,000 population in 1980 and 1985, respectively. In 1990 and 1992 the rates were 141.8 and 107.6 per 100,000 population.

Nutritional and Metabolic Diseases and Deficiencies

In 1975, 53% of children under 6 years old showed some degree of malnutrition: 40.9% mild, 11.2% moderate, and 1.1% severe. Among the same age group in 1982, the proportion was around 44%: 38% mild, 5% moderate, and 0.3% severe. In 1990, 21% of the children under 6 that were covered by the Ministry of Health's primary health care program showed malnutrition: 18.2% mild, 2.6% moderate, and 0.17% severe.

Other assessments made on the basis of height-for-age among 7-year-olds, indicated that the proportion exhibiting growth retardation had decreased from 20.4% in 1979 to 9.2% in 1989. The children who are malnourished belong to families whose principal source of income is agriculture, and children living in rural areas are the most severely affected.

A nutrition survey in 1982 found that 10% of children under 6 years of age were obese. In 1990, 3.2% of the population in this age group covered by the primary health care program was found to be overweight. Among adults a study using data from 1982 showed the prevalence of obesity to be 31.5% overall,

with a higher proportion in urban areas (38.5%) than in rural areas (28.2%). Obesity was more frequent among women (40%) than men (22%), and increased markedly with age among persons of both sexes. In the population under 35 years of age the prevalence was 32% among females and 14% among males, while in the population over 35 it was 51% among females and 30% among males. Another study indicated that the prevalence of obesity was 14.4% and 33.3% among rural males and females, respectively, and 20.7% and 39.2% among urban males and females.

The prevalence of diabetes mellitus in persons aged 15 and over was 4.2%; however, in persons aged 60 and over a study conducted in 1986–1987 found the frequency to be 13.9% overall, 15.8% among women, and 11.5% among men. Diabetes accounted for 2.3% of outpatient visits by women to CCSS establishments and 1.6% of visits by men. Among patients over the age of 44, the proportion of visits due to this disease increased to 5% for both sexes, and for those over 59 years of age, it increased to 8.2% for women and 6% for men. The death rate from diabetes in 1985 was 0.7 per 10,000 population, but it climbed to 1.0 per 10,000 in 1991, and diabetes ranked 16th among all defined causes of death.

Cardiovascular Diseases

Diseases of the circulatory system are the leading cause of death in Costa Rica. Since 1975 the death rate from this cause has fluctuated between 10.3 and 11.2 per 10,000 population. In 1991 cardiovascular diseases were responsible for 29% of all deaths. The leading causes within the group of circulatory diseases were acute myocardial infarction, atherosclerosis, ischemic heart disease, and cerebrovascular disease.

Malignant Neoplasms

Malignant neoplasms are the second leading cause of death. Since 1975 they have accounted for 20% of total mortality. The cancer death rate rose from 6.6 per 10,000 population in 1970 to 7.6 in 1991, and was higher among persons older than 45. Among males, the most common sites of malignancy were the stomach, with rates of 26.1 per 100,000 males in 1975 and 24.8 in 1991; prostate, with rates of 4.9 per 100,000 males in 1975 and 9.0 in 1991; trachea, bronchus, and lung, with rates of 6.4 per 100,000 population in 1975 and 7.8 in 1991; and liver and bile ducts, with a rate of 4.4 per 100,000 popu-

lation (in 1975 this type of cancer ranked 14th among causes of death, with a rate of 1.4 per 100,000).

Among females, stomach cancer was the most common type, with a rate of 13.4 per 100,000 females in 1975 and 13.8 in 1991. The second most common type was cancer of the uterine cervix, which in 1975 was the third leading cause of death among women. The mortality rate from this cancer increased from 5.5 per 100,000 women in 1975 to 8.1 in 1991. Third was breast cancer, which moved from second place among the leading causes of female death in 1975, with a rate of 5.7 per 100,000 women, to third place in 1991, with a rate of 6.7. The fourth most common site of malignancy was the pancreas, with a rate of 4.3 per 100,000 women.

In 1990 malignant neoplasms accounted for 3.6% of all CCSS hospital discharges.

Accidents and Violence

The group of causes comprising accidents, injuries, and poisoning is the third leading cause of death among the 17 major cause groups listed in the ICD-9 and was responsible for 4.4 deaths per 10,000 population in 1990. Deaths from transport accidents in 1990 made up 32% of total mortality from external causes. The most affected age groups were those 45 years and over, 35–39, and 20–34, among whom the rates were 30.3, 20.3, and 19.1 per 100,000 population, respectively. More males than females died in each of these age groups. Among all types of transport accidents, the leading cause of death was motor vehicle collisions with pedestrians.

In 1990 mortality from suicide accounted for 12% of total mortality from external causes. The 60-and-over age group was the most affected, with a rate of 9.8 per 100,000, followed by the 20–44 age group, with a rate of 9.2 per 100,000. Mortality from homicide constituted 10% of total mortality from external causes in 1990. Of the homicides investigated by the Judicial Investigation Agency in 1990, 18% were the result of conflicts between individuals, 16.5% resulted from fights, and 15.8% stemmed from robbery or assault.

Injuries, fractures, poisoning, and other external causes accounted for 6.4% of all CCSS hospital discharges in 1990.

Alcoholism, Smoking, and Drug Dependence

The prevalence of smoking among the population aged 18 years and over is 22.3%. The prevalence is

higher among males (33.8%) than females (11.2%) in all age groups. Male smokers also smoke more cigarettes per day. Fifty-four percent of males and 84.7% of females have never smoked, and 12.2% of males and 4.1% of females are ex-smokers. In 1984 the prevalence of smoking in the adolescent population was estimated at 12.7% (17.0% among males and 9.6% among females). Among those under the age of 15 the prevalence was 9.6% and among those aged 15–20 it was 14.9%.

The prevalence of alcohol consumption is 57% (10% of those who drink are excessive drinkers and 5% are alcoholics). The problem is greater among men than women. Drinking begins at very early ages: 10% of drinkers started drinking by 12 years of age, 26% by 15, and 46% by 18. Of the excessive drinkers and alcoholics, 80% and 59%, respectively, are between 15 and 34 years of age. In 1992 an increase in alcohol consumption among women was noted, with a 27% rise in moderate drinking and an 11.1% increase in excessive drinking in relation to 1980 levels.

In regard to the use of psychotropic drugs, 37 million doses of benzodiazepines were prescribed in 1990. It is estimated that 7.6% of persons aged 12 and over regularly take hypnotics, 6.9% take tranquilizers, and 5.1% take stimulants. In addition, 1.6% of this population uses marijuana and 0.5% uses cocaine.

Mental and Behavioral Disorders

In 1987 mental and behavioral disorders accounted for 6.3% of all outpatient visits to CCSS institutions; neurotic disorders were the leading cause for both sexes (3.2% among females and 2% in males), especially for those over the age of 20. In the population aged 20–59 years, neurotic disorders were the third leading reason for outpatient visits among women (4.1%) and the fifth among men (3.5%). In the group aged 60 and over, these disorders were the fourth leading cause among women (3.6%) and the seventh among men (9.8%). In 1990 psychoses, neurotic disorders, drug abuse, and other mental disorders accounted for 3% of hospital discharges. Such disorders were the sixth leading cause of hospitalization (1.9%) in the group aged 20–44, the fourth (4.2%) in the group aged 45–50, and the 12th (2.6%) in the group aged 60 and over.

Oral Health

In 1991 the DMF (decayed, missing, filled teeth) index among children under 12 years of age was 8.4,

which is a reduction from the figure of 9.1 reported in 1984. The problem is most severe in the provinces of Limón, Guanacaste, and Puntarenas. Periodontal disease becomes more common at advanced ages.

Risk Factors

Risks in the Physical Environment

Costa Rica has experienced increases in the accumulation of solid wastes, air pollution (caused mainly by motor vehicles), and contamination of water by chemical substances.

In 1990, according to the Costa Rican Institute of Water and Sewerage Systems (ICAA), 92.8% of the population countrywide was being supplied with water; nevertheless, in many communities the quality of the water is not optimum for human consumption. The ICAA reported that national coverage for collection and sanitary disposal of wastewater was 39%. Solid waste collection reaches only 46% of the population, and it is estimated that only 30% of the total amount collected is disposed of properly. The San José metropolitan area has one sanitary landfill, which is not satisfactorily managed.

Risks in the Work Environment

The number of pesticide poisonings in Costa Rica increased from 193 cases in 1987 (6.9 per 100,000 population) to 293 cases in 1990 (9.7 per 100,000). Information from the Ministry of Health indicates that 64% of the banana plantations studied did not have suitable systems for managing agrochemicals and 82% lacked adequate procedures for handling contaminated liquid wastes.

Natural Disasters and Industrial Accidents

Hurricane Joan, which skirted the Atlantic coast on 23 October 1988, caused serious flooding and cut off communication with several communities. The storm caused 21 deaths and left more than 7,500 persons homeless, in addition to destroying road systems. The most serious consequence of Hurricane Joan was the economic damage it caused through destruction of crops and livestock in the affected areas.

An earthquake occurred on 22 December 1990, affecting primarily the province of Alajuela. Although

many homes and buildings in the area were damaged, only one person died. Another earthquake occurred on 16 February 1991 in the Central Valley, destroying approximately 35 homes and causing moderate damage to 15 and slight damage to 66. The earthquake of 22 April 1991 in the province of Limón was one of the strongest ever to have occurred in Costa Rica. It caused tremendous infrastructure damage to the port of Limón and to road systems in the Caribbean region. Some damage was also reported in the provinces of San José and Cartago. Forty-eight people died and 561 were injured as a result of this earthquake, and another 6,841 sustained earthquake-related damages. A total of 2,894 homes were destroyed and 4,427 were damaged.

Contamination of Food

The most common type of foodborne disease is poisoning by *Staphylococcus aureus*, followed by shigellosis and salmonellosis. The reported incidence of staphylococcal food poisoning was 7.7 per 100,000 population in 1987 and 18.2 in 1990. The incidence of shigellosis was 1.6 per 100,000 in 1987 and 6.4 in 1990, and that of salmonellosis was 1.8 per 100,000 in 1987 and 3.4 in 1990.

A study conducted over the period 1985–1988 demonstrated the presence of aflatoxins in white corn; more than 50% of the samples analyzed showed levels ≥ 20 parts per million.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Public Policy

Despite the economic conditions prevailing in the country, the State has succeeded in implementing—particularly during the 1970s—a series of social and health policies that have made it possible to provide universal access to health services and improve health conditions among the population.

In the early 1980s, before the onset of the severe economic crisis and the subsequent imposition of structural adjustment programs, problems with the management and quality of health services, especially outpatient services, prompted the introduction of organizational and operational changes in the health sector and the institutions it comprises. As part of this process, in 1992 a health sector reform

project was proposed and formulation of the project began.

Population Policies

In December 1988 the National Council on Population Policies issued the Declaration on Population, which contained the principal guidelines, policies, and strategies followed by the Government during the period 1986–1990 in regard to population issues.

Health Policies and Strategies

The National Health Plan was instituted in the early 1970s. The Plan's principal objectives were: creation of a national health system; universalization of social security coverage and transfer of the hospitals of the Ministry of Health and the Social Welfare Boards to the CCSS; and development by the Ministry of Health of programs to improve rural health, community health, environmental health, and nutrition. At the same time, the Social Assistance Institute was created and the Law on Social Development and Family Allowances was enacted, which established funding and support for several development and prevention programs. In addition, the country adopted the primary health care strategy and embraced the goals of health for all by the year 2000.

During the 1980s the economic crisis led to stagnation and, in some cases, deterioration of health programs. The CCSS underwent a severe financial crisis and was obliged to ration and curtail spending, which affected the supply and quality of health care. In addition, it was forced to reapportion contributions to the fund, increasing the amount of employer and employee contributions and reducing those of the State. Ministry of Health revenues declined, which impaired the primary health care programs under its responsibility. In the mid-1980s policies were outlined which established priority areas of action, with emphasis on health promotion and disease prevention. At the same time, efforts were initiated to bring about administrative reform of health institutions and reorganization of the sector. An important milestone in these latter efforts was the signing of an agreement integrating the services of the Ministry of Health and the CCSS.

During the period 1986–1990, in the framework of structural adjustment programs, the Government initiated a gradual but systematic process of State reform, mainly in the economic sector. Although few changes

were made in the area of social policy, including health policy, several of those that were made were significant. Efforts centered mainly on promoting administrative reforms and strengthening the processes of regionalization and decentralization-deconcentration, particularly through the development of local health systems.

Noteworthy among the specific actions taken were the renewal of the service integration agreement between the Ministry of Health and the CCSS and the implementation of several pilot projects aimed at developing a model for comprehensive health care and testing new forms of health services administration. Among the administrative models tested were the assessment of a per capita health care tax, administration of the network of services in a health area by health workers' cooperatives, and a family and community health care program.

In 1989 a policy decision was made to establish and develop local health systems. This policy was reiterated in the Sectoral Health Plan for 1991–1994 as the fundamental strategy for achieving the reorganization of the health system and its institutions. The State reform program initiated in 1990 assigns great importance to the health sector, and drafting of a health sector reform proposal began in 1992.

Organization of Services

The National Health System, established in 1989, is composed of the Ministry of Health, the CCSS, the National Insurance Institute (INS), the Costa Rican Institute of Water and Sewerage Systems (ICAA), universities, private medical services, self-managed cooperatives and companies, municipal governments, and communities. In practice, it is the first four entities that make up the public health sector. Universities and other institutions of higher education are linked to the system only through the various schools and research centers that provide training in the health field. The participation of municipal governments is limited to responsibility for waste management and some water systems.

The Ministry of Health, which heads the sector, is responsible for primary health care programs, environmental services, and epidemiologic surveillance. Attached to the Ministry are two semi-autonomous institutions: the Costa Rican Institute on Alcoholism and Drug Dependence (IAFA) and the Costa Rican Institute for Research and Teaching in Nutrition and Health (INCIENSA).

The CCSS provides health recovery and rehabilitation services, and it supports the Ministry's health promotion and disease prevention programs. The CCSS also administers sickness, maternity, disability, old-age, and death benefits. The INS, which continues to maintain a monopoly over insurance plans in the country, administers insurance benefits for work-related injury. The ICAA is responsible for drinking water supply and sewerage services in most of the country.

Personal Health Care Services

This subsystem is made up mainly of the Ministry of Health and the CCSS. The INS, three health cooperatives, and a number of small nongovernmental organizations are also involved, though to a lesser extent. Although there continue to be problems with duplication of effort and lack of coordination between the institutions of the sector, actions taken over the last 10 years have ensured better intersectoral and intrainstitutional articulation.

Production of Services and Coverage of Programs

The CCSS is responsible for close to 97% of the hospital services and 90% of the outpatient services provided in the country. It covers almost 95% of the population. In 1990 CCSS establishments handled a total of 8.2 million outpatient visits, or 2.71 visits per capita. Of the per capita visits, 1.19 were for general medical care, 0.72 were visits to specialists, 0.21 were dental visits, and the remainder were visits to other professionals. That same year the CCSS registered 290,988 hospital discharges (96 per 1,000 population), a figure that is 5% lower than the total for each of the 5 preceding years. Surgical operations totaled 125,042 (4 per 100,000 population). As for drugs, 22.9 million prescriptions were written in CCSS establishments (7.63 per capita and 3 per visit). The CCSS laboratory network performed 13.5 million tests (approximately 4.5 per capita). Of the births that occurred in the country in 1990, 86.3% were attended in CCSS establishments.

In 1989 there were 2,575 discharges from Ministry of Health hospitals (0.9 per 1,000 population) and 497,311 outpatient visits to Ministry establishments (0.16 per capita). Of these visits, 190,411 were well-child visits, 112,411 were for prenatal care, and 52,149 were for general medical care. Ministry establishments also performed 51,431 cytology examinations and provided 145,825 family planning consultations.

The Ministry of Health is responsible for primary health care programs in rural and urban areas. In 1992 such programs were operational in 783 health areas distributed throughout the country and covered 1.4 million people (47% of the population). These health areas are the responsibility of technicians who receive 6 months of basic training and carry out health promotion and disease prevention activities through home visits.

The following vaccination coverage rates for 1992 among children under 1 year of age were estimated on the basis of registered live births in 1991 (81,110): 90.5% for three doses of DPT, 90.6% for OPV, 84.2% for measles vaccine, and 94% for BCG.

Environmental Services

In addition to the Division of Environmental Sanitation within the Ministry of Health, environmental services are provided by the ICAA, the municipal governments, and the Public Services Company of Heredia.

Available Resources

Human Resources

Together, the CCSS and the Ministry of Health employ close to 90% of the human resources in the health sector. In 1991 the CCSS had 25,599 health employees, (approximately 75% of the resources of the sector), and the Ministry had 5,718, for a total of 31,317 (10.3 per 10,000 population). Of these workers, 2,759 were physicians (9 per 10,000 population), 339 were dentists (1.1 per 10,000 population), 397 were microbiologists (1.29 per 10,000 population), 221 were pharmacists (0.72 per 10,000 population), and 1,630 were professional nurses (5.28 per 10,000).

In 1990 the ICAA had 3,100 employees, and the INS had 58 workers engaged directly in health-related activities (2.5% of its total staff).

The human resources in all areas, in terms of rates per 10,000 population, increased between 1970 and 1987. Approximately 49% of the health sector work force carries out activities related to personal health care and environmental protection. The rest perform administrative or general service duties. Although two-thirds of the work force is concentrated in the Central region—where the central offices, the principal medical centers, and a large proportion of the popula-

tion are located—only one-tenth of these persons are engaged in central-level administrative activities.

The three health cooperatives in existence in 1993—which provided services under contract to the CCSS and the Ministry of Health—had a total work force of about 350.

Training for health personnel is provided by several public and private institutions, which are either part of a university or linked to one, especially the University of Costa Rica. Each institution in the sector has responsibility for the continuing education and training of its personnel. The CCSS, in particular, provides such training through the Center for Strategic Development and Information on Health and Social Security.

The country has never had coordinated programs and policies with regard to human resources development, which has led to imbalances between the quantity, type, and distribution of available resources, on the one hand, and the health needs of the population and the programs carried out to address them, on the other.

In 1989 there were 3,179 students enrolled in university programs in the health sciences: 70.6% at the University of Costa Rica, 9.2% at other public institutions, and 20.2% at private universities. The University of Costa Rica established a graduate degree program in public health in 1989.

Financial Resources

During 1990 public spending on health represented 7.8% of the GDP. Spending remained at around this level throughout the period 1988–1992. The revenues of health sector institutions in 1990 amounted to US\$ 378.98 million, while spending by these institutions totaled US\$ 385.78 million; spending by the Ministry of Health and the CCSS accounted for 87% of the US\$ 6.80 million deficit.

The breakdown of health spending by the various sector institutions was as follows: Ministry of Health, 10.8%; CCSS, 72%; IAFA, 0.5%; INCIENSA, 0.3%; ICAA, 8.1%; and INS, 8.3%. Most (69%) of the revenues of the health sector come from employer-employee contributions to the social security system and workers' insurance plan, 7% from funds allocated under the national budget, 8.7% from fees charged for goods and services, 4.7% from the Fund for Social Development and Family Allowances, and 11.6% from the proceeds of lotteries and other sources.

Hospital services account for 34% of total spending (54% of CCSS spending), CCSS outpatient services for

27%, and Ministry of Health programs for 10%. Services provided by other sector institutions account for the remainder.

According to a survey carried out in 1987 and 1988 by the Department of Statistics and Censuses, private spending on health amounted to US\$ 77.20 million in 1988, which is equal to 23% of the amount spent by the Ministry of Health and the CCSS that year.

Physical Resources

In 1992 the Ministry of Health had 61 health centers and 379 health posts. In addition, it provided services jointly with the CCSS in 60 establishments (1 regional hospital, 4 peripheral hospitals, and 55 clinics), making a total of 500 health centers and posts wholly or partially under Ministry responsibility. The resources of the Ministry of Health also include 64 school dental clinics, 24 mobile medical units, 59 mobile dental units, 462 health education and nutrition centers (CEN), 62 health education and nutrition centers and school lunchrooms (CENCE), and 44 comprehensive child health and nutrition centers (CINAI).

The CCSS operates 29 hospitals (9 national, 7 regional, and 13 peripheral) and 141 outpatient clinics, 2 of which are administered by health cooperatives. In addition, it provides outpatient services at 2 health centers and 2 health posts of the Ministry of Health (joint health centers). CCSS resources also include 21 community health posts or clinics, which operate out of their own facilities or out of facilities owned by the community or by a health cooperative.

According to data from 1989, the Ministry of Health had 40 beds in rural health centers, 50 at the INCIENSA, and 127 at the IAFA. In 1991 the CCSS had 6,382 beds (20.6 per 10,000 population); 66.4% were in the national hospitals, 18.6% were in the 7 regional hospitals, and 15.0% were in the 13 peripheral hospitals. Of the total number of beds available, 27% (5.5 per 10,000) are designated for chronically ill patients and the rest for acutely ill patients. There are 742 pediatric beds, 47% of which are at the National Children's Hospital.

In 1991 there were 289,316 hospital discharges. The bed occupancy rate was 78.2%, the average hospital stay was 6.1 days, and the bed turnover rate was 45.4. As for outpatient services, productivity was 3.8 medical consultations per contracted hour (1,573,309 hours), 2.4 dental consultations per contracted hour (267,414 hours), and 2.1 consultations per contracted hour for other professionals (101,665 hours). The num-

ber of both hospital discharges and outpatient services remained more or less constant during the period 1989–1990.

The Ministry of Health/CCSS network of services in 1992 included 119 clinical and 16 specialized laboratories, 175 pharmacies, 45 diagnostic imaging facilities (3 with CAT scan equipment), and 27 blood banks associated with the laboratories of the hospital network and with the National Blood Bank, which is operated jointly with the Red Cross.

In the public sector, infrastructure for the production of drugs and biologicals is limited. Only the CCSS has any facilities, and they consist of one small laboratory that makes pharmaceutical products, one that produces parenteral solutions, and another that makes chemical reagents.

The INS operates one temporary shelter and health center, one central clinic that provides outpatient services, and 16 small dispensaries located strategically throughout the country. It contracts out the bulk of the

services it offers to the CCSS and to private clinics and physicians.

In 1991 the ICAA operated 118 water systems. It has five regional offices and several local agencies.

The private health care sector is not extensive. As of early 1992 it included only four small private clinics with a total of 155 hospital beds; 352 pharmacies; 195 clinical laboratories; and 25 diagnostic imaging facilities (one with CAT scan equipment). The sector also includes a large number of private physicians and dentists and a small number of rehabilitation clinics and dental, pathology, and cytology laboratories distributed throughout the country. However, no records or reliable data are available on the size of this private network.

The country has 26 private laboratories or companies engaged in the manufacture of pharmaceutical products; 20 are domestically owned and 6 are run by multinational firms. Two of the latter are located in free trade areas and process products for export.

CUBA

GENERAL HEALTH SITUATION AND TRENDS

As of 30 June 1992, the population of Cuba numbered 10,821,714 and the population density was 97.6 inhabitants per km².¹

The country's fertility rate has declined steadily: in 1985 the general fertility rate was 66.1 per 1,000 women 15–49 years of age; in 1990 it was 62.1 and in 1992, 50.9. The birth rate per 1,000 population was 14.5 in 1992. The group of persons aged 65 and over continues to grow in both absolute and proportional terms; in 1992 this group constituted 8.9% of the population. Persons under 15 made up 28.1% of the country's total population in 1983, 23.7% in 1988, and 22.4% in 1992. The crude death rate in 1992 was 7.0 per 1,000 population. Between 1985 and 1991, the lowest rate (6.2 per 1,000) was recorded in 1986 and the highest (6.8) in 1990. Life expectancy at birth for the period 1990–1995 has been calculated at 76.1 years for the general population, 74.3 years for men, and 78.4 years for women. Chronic degenerative diseases and accidents have now clearly replaced infectious and parasitic diseases—which contributed significantly to mortality 30 years ago—as the leading causes of death.

The country's political-administrative units consist of 14 provinces and one special *municipio* (Isla de la Juventud). The number of inhabitants in each province ranges from 0.5 million to 1 million, except in the province of Ciudad de la Habana, which has a population of slightly more than 2 million.

Health and Living Conditions

In recent years, particularly 1991 and 1992, the country has experienced serious economic difficulties, brought on by two main factors: the embargo imposed by the Government of the United States of America,

which has been in effect for more than 30 years, and the breakup of the Soviet Union and the socialist bloc, which accounted for 85% of Cuba's foreign trade until 1989. By late 1992, the volume of the country's trade with countries of the former socialist bloc had dropped to 7% of previous levels, and in that year Cuba was able to obtain only 6 million tons of oil, in contrast to the approximately 13 million tons it had imported in 1989. According to estimates by experts, to date the embargo has cost Cuba more than US\$ 40,000 million. In 1989 the import capacity of the country was US\$ 8,100 million annually, but in 1992 it was only US\$ 2,200 million. To make matters worse, the prices of some of the country's main export products have fallen. In the face of this situation, the Government is endeavoring to minimize the impact of the economic deterioration on the population and is seeking to revitalize and reorient the economy in accordance with the new world context so that the country may resume development as quickly as possible. The serious economic problems cited above have had a number of repercussions on the living conditions of the Cuban people, including reductions in public transportation services, planned electrical power outages, and difficulties with the supply of some foods and drugs, which, along with other factors, directly or indirectly affect the health of the population.

Despite the shortages and difficulties of the last 3 years—which have brought about some degree of deterioration in the standard of living—up to 1992 the morbidity and mortality indicators continued to improve. One explanation for this apparent contradiction, among other technical factors, is that morbidity and mortality indicators—especially the latter—are not sensitive enough to provide a short-term reflection of the impact of changes in living conditions on health. The basic reasons why there has not been greater deterioration in health indicators, especially morbidity indicators, are the great capacity and effectiveness of the National Health System; the high cultural level of the Cuban people and their active participation in social and health programs, which enhances their ability to cope with the crisis; the health consciousness of the population, who consider health one of the country's

¹Except where another source is specified, all data appearing in this document are from the National Department of Statistics of the Ministry of Public Health of Cuba.

greatest social triumphs; and Cuba's social and health policies, which have maintained their priorities despite the current difficult conditions.

Part of the Government's social policy has been to maintain the supply of basic foods for the entire population. It has continued to ensure access to free education and medical care. It guarantees temporary employment to any worker whose factory closes down temporarily or provides a subsidy equivalent to 60% of the worker's salary until production resumes. In particular, the Government has sought to protect the most vulnerable groups, including children, women, the elderly, and the infirm, which has helped to mitigate the social impact of the adverse situation.

The proportion of women in the labor force has increased significantly; 44.6% of working-age women were employed in 1989, almost 10% more than in 1980, when 34.7% were employed. Women make up 39.1% of the general labor force and 55% of the technical work force.

The health situation in the early 1990s is strongly conditioned by the socioeconomic changes that have taken place in Cuba during the past two decades and by the priority the Government has given to health issues. The discrepancies among various groups have been considerably reduced, and living and health conditions for the entire population are now quite homogeneous.

The right of everyone to employment and the access of 100% of the population to free education and medical care, enhanced through the country's family doctor and nurse plan, have been important factors in the changes that have occurred. Illiteracy was eradicated in the 1970s, and during the 1991–1992 biennium 98% of children aged 6–14 years were enrolled in regular primary and secondary education courses.

The extension of electric service, especially to families living in mountainous and rural areas, has been a priority focus of social policy during this period, and 95% of the homes in the country were being supplied with electric power by 1992. These facts, together with the access of the entire population to staple foods, the regulation of housing prices and rents and rigorous control to prevent discrimination for any reason, the existence of a single common language, and the absence of national minorities, explain the homogeneity that characterizes the country.

This homogeneity necessitates a special approach for analyzing health differentials in relation to living conditions, since it is difficult to stratify the population on the basis of poverty, education levels, access to basic commodities, and other variables generally used

to classify populations according to living conditions. Consequently, the analysis presented here looks at differences between territories and provinces and between urban and rural areas.

Historical development and the predominant economic activities practiced in various regions of the country, which are closely linked to geographic and climatic features, have given rise to slight differences in living conditions. Nevertheless, the reduction in social differences, as described above, is clearly reflected in the behavior of some health indicators.

In 1991, 8.5% of the total population was 65 years or older, but the figure was 9.8% in the seven western provinces compared with 6.9% in the seven eastern provinces. The population in the eastern portion of the country is younger, and this difference shows up in figures on morbidity from chronic diseases, according to information obtained through monitoring by family doctors and nurses up to 1992.² Monitoring data on patients with diabetes mellitus shows a prevalence of 16.7 per 1,000 population countrywide, 18.6 in the western portion of the country, and 13.1 in the eastern portion. The prevalence of arterial hypertension is 55.4 per 1,000 population for the country as a whole, 64.9 for the western portion, and 45.9 for the eastern portion.

Infant mortality has continued to decline, going from 11.9 per 1,000 live births in 1988 to 10.7 in 1990 and 10.2 in 1992. In 1990 the rate was 9.3 in the western provinces and 12.0 in the eastern provinces. By 1992 the difference had narrowed considerably: 10.0 in the western region and 10.6 in the eastern. If the country is divided into three regions, the one made up of the three central provinces (Villa Clara, Cienfuegos, and Sancti Spiritus) shows lower rates than either the western or the eastern region, with rates of 8.4, 7.9, and 8.3 per 1,000 live births in 1990, 1991, and 1992, respectively. An analysis of infant mortality by province for 1975–1992 reveals a downward trend in all the provinces and progressively less deviation of the rates from the median.

Another way to examine health differentials in relation to living conditions is to compare population groups living in predominantly urban environments, those living in predominantly rural environments, and

²A key element of Cuba's family doctor and nurse program model is active monitoring of both well and sick persons, through dynamic observation and the application of preventive, curative, and rehabilitative measures, with a view to strengthening people's capacity to lead healthy and productive lives.

those living in environments that are a mixture of urban and rural.³

As in the vast majority of developing countries, rural areas in Cuba were historically underserved. However, because of the high priority the Government has assigned to development in these areas, the difference in indicators between urban and rural areas has been significantly reduced. For example, under the family doctor and nurse program, health care coverage in rural areas is now 100%.

Education and health services have been made geographically, economically, and culturally accessible to the rural population. In mountainous areas a socio-economic growth plan is being carried out to improve living and working conditions through the development of mountain communities. The people in these areas now enjoy suitable housing and social services, including coverage for 100% of the population under the family doctor and nurse program. Less than 5% of the population lives more than 5 km away from some communication route, even in the most remote areas.

The urban population has grown from 70% of the total population in the mid-1980s to 73.9% in 1990, according to estimates based on the two latest censuses (1970 and 1981). If the population of the 169 *municipios* in the country is classified by area of residence, 51.5% of the total population lives in predominantly urban *municipios*, 19.0% lives in predominantly rural *municipios*, and 29.5% lives in mixed urban-rural *municipios*. The population under 15 years of age constitutes a slightly larger proportion of the total population in rural areas (25.3%) than in urban areas (21%). The reverse is true of the age group 15–64 (69.9% in urban areas and 67.5% in rural areas) and the age group 65 years and older (9.1% in urban areas and 7.2% in rural areas). The figures for the mixed urban-rural areas have been omitted from this analysis, but they fall somewhere in between those corresponding to the other two categories.

Table 1 shows the rural-urban differential in mortality among the population under 15 years old and among the population 15 and over. The ratio of rural to urban infant mortality rates is about 1.5:1, and the ratio of mortality rates for the 5–14 age group is almost 2:1. However, after the age of 15 these trends are reversed, and in the 65–74 age group, for example, the mortality

³Areas were considered predominantly urban if more than 75% of the population lived in urban areas, rural-urban if between 50% and 75% of the population was urban, and predominantly rural if less than 50% of the population lived in urban areas.

TABLE 1
Mortality rates and ratios by age and urban or rural residence, Cuba, 1991. Rates are per 1,000 live births for the under-1-year age group and per 100,000 population for the other age groups.

| Age (years) | Urban | Rural | Ratio of rural rates to urban rates |
|-------------|---------|---------|-------------------------------------|
| <1 | 9.1 | 14.5 | 1.6 |
| 1–4 | 62.4 | 69.8 | 1.1 |
| 5–14 | 21.1 | 39.0 | 1.8 |
| 15–49 | 179.5 | 167.4 | 0.9 |
| 50–64 | 934.1 | 732.2 | 0.8 |
| 65–74 | 3,172.5 | 2,109.5 | 0.7 |
| 75 and over | 9,700.9 | 7,456.0 | 0.8 |
| Total | 769.2 | 510.6 | 0.7 |

Source: Ministry of Public Health.

rate in urban areas is 1.5 times higher than in rural areas.

Among children under 1 year, influenza and pneumonia cause twice as many deaths in rural areas as in urban areas. Rates of mortality from congenital anomalies, sepsis, and intestinal infections are also higher in rural areas, although in absolute terms the rates are low. As in the under-1-year age group, the rates of mortality from congenital anomalies in the age group 1–4 years are higher in rural than in urban areas (1.3:1 ratio). Mortality from external causes is also higher in rural areas (1.3:1), largely as a result of accidents (which occur at a ratio of 1.6:1 in rural as compared to urban environments).

Among the group 5–14 years of age, the differences between urban and rural mortality rates are even greater. Mortality from infectious and parasitic diseases is 0.3 per 100,000 population in urban areas but reaches rates of 3.0 in rural areas, for a rural/urban mortality ratio of 10:1. For malignant neoplasms the ratio is 1.8:1; for diseases of the circulatory system, 2.5:1; and for violent deaths (four-fifths of which are due to accidents), 1.5:1. Congenital anomalies, which in the under-1-year and 1–4-years age groups cause slightly more deaths in rural areas than in urban, produce 6 times more deaths in rural areas in the group aged 5–14 (4.2 per 100,000 in rural areas compared to 0.7 in urban areas). On the other hand, while there are very few deaths from bronchial asthma in urban environments, there are none from this cause in rural areas, which helps to balance the other disadvantages of the 5–14-year-old population in rural areas.

Mortality among persons aged 15–49 years shows a completely opposite pattern with regard to urban-

rural differentials from mortality in the 5–14 age group. Infectious and parasitic diseases among this group cause 1.5 times fewer deaths in rural areas than in urban areas, and malignant neoplasms cause 1.2 times fewer (the rate is lower still in frequent sites such as trachea, bronchus, and lung; breast; and others). Diseases of the circulatory system cause 1.4 times fewer deaths in rural areas and, within this category, myocardial ischemia causes 1.8 times fewer; cerebrovascular disease, 1.5 times fewer; and accidents, 1.1 times fewer.

Among persons over 50 years of age there are no significant differences between rural and urban areas with regard to causes of death. In addition, the rates in mixed urban-rural areas were not found to differ markedly from those in urban or rural areas; in most cases these areas had rates that fell somewhere between the urban and rural rates.

Various studies on the completeness of death certification have shown that underregistration of deaths continues to decline. In 1980 the rate of underregistration was 0.5%, and the statistics being reported at present can be considered reliable and virtually complete. With regard to the quality of certification, the proportion of deaths attributed to signs, symptoms, and ill-defined conditions averaged 0.28% per year during the period 1982–1984, and in 1990 and 1991 it was under 0.4%.

Death certificates can be filled out only by physicians, who are solely responsible for the quality of the primary data reported therein. Work is currently being done with medical students and residents to help improve accuracy in the certification of causes of death.

Mortality

For the last several years, noncommunicable chronic diseases have shown a marked predominance as causes of death in the general population. The most important change in recent years has been the decline in mortality from influenza and pneumonia. At the same time, rates of death from diabetes and cirrhosis and other chronic liver disease have increased, as can be seen from Table 2.

A breakdown of mortality by age group reveals that rates are lowest for the children aged 5–14 years and then rise progressively, reaching a maximum for the group aged 65 and over. While mortality has declined among all age groups, the biggest reduction has occurred among children under 5 years, and especially those under 1, among whom the rate fell 57% between 1975 and 1990.

TABLE 2
Leading causes of death (adjusted rates per 100,000 population), all ages, Cuba, 1992 and 1985.

| Causes | 1992 | 1985 |
|---|-------|-------|
| Heart disease | 173.4 | 177.4 |
| Malignant neoplasms | 115.5 | 113.3 |
| Cerebrovascular disease | 60.9 | 58.5 |
| Accidents | 45.8 | 40.6 |
| Influenza and pneumonia | 22.7 | 40.2 |
| Diseases of the arteries, arterioles, and capillaries | 23.5 | 22.9 |
| Suicide and self-inflicted injury | 19.2 | 20.9 |
| Diabetes | 19.3 | 15.1 |
| Bronchitis, emphysema, and asthma | 8.3 | 8.0 |
| Chronic liver disease and cirrhosis | 7.7 | 6.4 |

Source: Ministry of Public Health.

Infant mortality in 1992 accounted for only 2.1% of all deaths, down from 2.6% in 1991. The five leading causes of death in children under 1 year in 1991 were responsible for about 80% of all infant deaths. In descending order, these causes were: certain conditions originating in the perinatal period, at a rate of 4.2 per 1,000 live births; congenital anomalies, at 2.6; influenza and pneumonia, at 0.7; enteritis and other diarrheal diseases, at 0.5; and accidents, at 0.4. In 1992, for the first time enteritis and other diarrheal diseases, at a rate of 0.3 per 1,000 live births, was not among the five leading causes of death in this age group. Since the early 1980s a national program has been in effect for the early detection of congenital anomalies, and the results have been quite good. Between 1980 and 1992 mortality from this cause decreased from 3.8 to 2.6 per 1,000 live births and from 8.2 to 6.9 per 100,000 population (all ages).

Mortality from all causes in the group aged 1–4 years has decreased from 1.0 deaths per 1,000 in 1985 to 0.7 in 1991. Accidents, at a rate of 1.9 per 10,000 population, are the leading cause of death in this group and have been for more than a decade. Congenital anomalies and malignant neoplasms, at rates of 0.9 and 0.6, respectively, in 1991, have ranked second and third since 1988. In the early 1980s, pneumonia was the second leading cause of death, and meningococcal infections assumed third place in 1986. Since 1988—when the epidemic of meningococcal meningitis that persisted throughout most of the 1980s began to subside—pneumonia and meningococcal infections have alternated in fourth and fifth place, with rates that have fluctuated between 0.7 and 0.2 per 10,000 population.

Mortality from all causes in the group aged 5–14 years was 0.4 per 1,000 in 1991 (the lowest mortality of all age groups). Accidents are the leading cause of death and account for a disproportionate number of deaths in this group. In 1991 accidents caused 18.1 deaths per 100,000 children aged 5–14 (273 deaths), which amounts to 46% of all the deaths in this group and is more than twice the number caused by the other four leading causes together: malignant neoplasms, 3.9 (59 deaths), congenital anomalies, 2.9 (44), heart disease, 0.9 (14), and nephritis and nephrosis (9).

If the deaths from accidents in the 5–14 age group are added to those in the 1–4 age group—in which they accounted for 28% of the total—this cause is responsible for 37.8% of all deaths among children aged 1–14. There is an obvious need to reduce the incidence of this avoidable cause, which not only produces many unnecessary deaths but leaves people impaired and disabled, often for life.

Mortality from all causes in the group aged 15–49 years was 1.8 per 1,000 population in 1991. The leading causes of death have not changed since the early 1980s, although their ranking has varied. Accidents are the leading cause, with rates of 39.1 per 100,000 in 1985, 42.0 in 1990, and 40.7 in 1991. The second leading cause from 1985 through 1987 was suicide and self-inflicted injury, with rates of 24.5, 26.3, and 26.6, respectively, for those 3 years. This cause dropped into third place in 1988–1991, while malignant neoplasms moved into second place, causing 25.9 deaths per 100,000 population 15–49 years old in 1991. The fourth and fifth leading causes of death have invariably been heart disease and cerebrovascular disease. Among the latter group of causes, cerebrovascular accidents were responsible for 23.2% of all deaths in this age group.

Mortality from all causes in the population aged 50–64 years was 8.7 per 1,000 in 1991. The five leading causes of death in 1990 were the same as in the period 1985–1990, and their ranking also remained the same. Heart disease ranked first (266.4 per 100,000 population aged 50–64), followed by malignant neoplasms (255.0), cerebrovascular diseases (94.9), accidents (43.9), and diabetes mellitus (41.5).

In the group aged 65 years and over, mortality from all causes was 51.4 per 1,000 in 1991. Rates of death from heart disease, which are dominated by myocardial infarction, varied only slightly between 1985 and 1991, when the rate was 1,777.6 per 100,000 population. The other leading causes of death in this age group are malignant neoplasms, cerebrovascular diseases, influenza and pneumonia, and diseases of the

arteries, arterioles, and capillaries, among which arteriosclerosis predominates.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

Perinatal mortality has declined significantly—from 22.6 per 1,000 live births in 1980 to 14.2 per 1,000 in 1992. This 37.2% reduction during the period was chiefly due to a decrease in neonatal mortality, which accounted for more than 90% of the total reduction. The leading causes of perinatal death have varied little. They are hypoxia, asphyxia, and other respiratory conditions; congenital anomalies; intrauterine growth retardation; birth trauma; hemolytic disease; and respiratory distress syndrome.

Rates of low birthweight have remained essentially the same in recent years. In 1992, 8.1% of all infants weighed under 2,500 g at birth. Only 1% of children under 1 year old were below the third percentile with regard to weight-for-height; among children 1–4 years of age the figure is 0.3%.

The leading causes of mortality and morbidity among children under 1 year continue to be certain conditions originating in the perinatal period and congenital anomalies. The latter are the second most frequent cause of death for the groups aged under 1 and 1–4, and the third leading cause in the group aged 5–14, although the rates fall sharply as age increases.

Acute diarrheal diseases and acute respiratory infections account for a large proportion of morbidity among children. In 1991 acute diarrheal diseases were responsible for 591,726 doctor visits among children under 10, while acute respiratory infections accounted for 2,359,522.

Vaccine-preventable diseases are not responsible for any morbidity among children under age 5. Poliomyelitis caused by wild poliovirus was eradicated in the early 1970s, and since 1972 there have been no reported cases of neonatal tetanus. The last reported case of diphtheria was in 1979, and between 1990 and 1992 only one case of whooping cough was reported, in 1992. The incidence rates for typhoid fever, measles, mumps, and rubella in 1992 were extremely low: 0.5 per 100,000 population for typhoid fever and 0.1 per 100,000 for the other three diseases. In 1992 the immunization program achieved coverage levels among

children under 1 year of 97.9% for BCG, 97% for OPV, and 90.6% for meningococcus B vaccine. The coverage level for the MMR (mumps, measles, rubella) vaccine at 1 year of age was 97.9%. Immunization against hepatitis B was begun in October 1992, and by the end of that year coverage for the first dose had reached 82%.

The principal cause of health problems and also the leading cause of death among children aged 1–14 years is accidents. The growing recognition in all social sectors that accidents are a major health problem in the country has given rise to intersectoral interventions aimed at preventing accidents. Some of these interventions are currently under way; others are being planned on the basis of results from epidemiologic and sociologic studies. In the province of Villa Clara a local program for the prevention of childhood accidents has been in effect for several years, and the early results are encouraging. In 1993 an action program was launched by the Ministry of Public Health, the Domestic Demand Institute, the mass media, and various national and international organizations, in collaboration with PAHO.

Health of Adolescents and Adults

Accidents remain the leading cause of death in the population under 50 years of age. Mortality from accidents was 37.5 per 100,000 population aged 15–49 in 1992. Accidents are one of the most serious health problems among adolescents and young adults.

Another important problem for adolescents and adults is morbidity from sexually transmitted diseases, which increased markedly during the 1980s (see section on sexually transmitted diseases, page 160). Among the communicable diseases, the rates of viral hepatitis in this age group were particularly high during 1989–1992, ranging from 106.3 to 295.1 per 100,000.

Among adults, the pattern of morbidity that gradually becomes established indicates the principal causes of death that will affect this age group and the elderly, namely, circulatory diseases, cancer, and external causes, in particular accidents.

Health of the Elderly

In 1992, 82.4% of all deaths were of persons aged 50 years and over, and 65.4% were of persons aged 65 and over. Toward the end of active working life, rates of heart and cerebrovascular diseases, malignant neoplasms, diabetes mellitus, and arterial hypertension begin to rise. At the same time, arteriosclerosis, as a

basic involitional process, occurs in combination with the chronic problems characteristic of advanced age and the lessening of motor activity. These phenomena are frequently associated with insufficiency of organs and systems, such as the kidneys or liver. Additional problems common among the elderly are falls, other external causes, and terminal pneumonia, which is often erroneously considered the primary cause of death.

Health of Women

According to data from the program for early detection of uterocervical cancer, in 1992 the rates of examination per 1,000 women in the age groups 20–29, 30–39, and 40 and over were 337.5, 310.3, and 175.3, respectively. The principal deficiency that has been identified in this program is that a high proportion of young women who are at very low risk are being examined, while detection efforts should be focused on the group aged 40 and over. The breast cancer detection program is currently being established and developed. In 1992, 136,715 women at risk were detected, 62.4% of whom underwent mammography.

Pregnant women receive a high number of prenatal examinations, the average having risen from 11 in 1980 to 17.2 in 1992. The average number of well-baby visits per child under 1 year of age ranged from 11 to 13.4 between 1988 and 1992; when the number of visits occasioned by illness is added, the average number of visits per infant was 22 in 1992. Studies are under way to determine whether the number of prenatal and well-baby visits provided is excessive since, beyond a certain point, as the number of such visits increase, their usefulness decreases.

Induced abortion is a health problem among women, and efforts are being made to diminish and eventually eliminate it. Abortion has declined from 83.6 per 100 deliveries in 1985 to 70.0 in 1992. A program has been established to increase the use of contraceptives and reduce to a minimum the intentional termination of pregnancy. Of the women in conjugal relationships, slightly under 80% use contraceptives. Maternal deaths from complications of pregnancy, childbirth, and the puerperium declined from 7.1 per 10,000 live births in 1970 to 5.3 in 1980 and 3.2 in 1992.

Workers' Health

The principal causes of work-related morbidity are accidents and some occupational diseases, although

the rates for the latter are low. Routine monitoring is carried out for lead poisoning, inhalation of mercury gases, leptospirosis, and poisonings. There has been an encouraging downward trend in the number of workers injured in occupational accidents, with the rate decreasing from 21.50 per 1,000 workers in 1983 to 15.40 in 1992. Similarly, fatal accidents declined from 9.76 per 100,000 workers in 1983 to 5.53 in 1992. Another indicator that showed improvement is the number of workers injured per million worker-hours, which decreased from 10.50 in 1983 to 7.90 in 1992.

Diseases and Health Impairments

Beginning in mid-1992 an outbreak of *epidemic neuropathy* was reported in Cuba. The epidemic began in the western region and by early 1993 had spread throughout the country. As of 22 June 1993, 46,030 cases had been reported, for a cumulative incidence of 422.85 per 100,000 population. The first cases were detected in the province of Pinar del Río among adult men living in rural environments and engaged in tobacco cultivation; they were smokers and moderate drinkers. These men exhibited symptoms of optic neuropathy. In early 1993 a change occurred in the evolution of the disease, and peripheral neurological disorders that were sometimes, but not always, associated with optic neuropathy began to be observed.

The disease affects both sexes. The specific rates as of 22 June 1993 stood at 510.4 per 100,000 females and 348.5 per 100,000 males. The majority of the cases have occurred in persons between 25 and 64 years of age; at highest risk are persons aged 45–64, among whom the rate has reached 856.8 per 100,000 population, followed by the 25–44 age group, with a rate of 675.9. There have been very few cases among children and adolescents.

The neuropathy has taken three clinical forms: one predominantly optic, another with symptoms of peripheral neuropathy, and a third that is a combination of the other two. The optic form has predominated among men and the peripheral among women. Peak incidence occurred between 28 March and 10 April 1993. By late May the incidence of the optic form had begun to fall, and the peripheral form began to abate in mid-June.

No definite conclusions have been reached as to the etiology of the disease. The most widely accepted hypothesis suggests that multiple factors are involved, including toxic and nutritional factors and possibly a virus, although contagiousness has not been demonstrated. All the patients have been treated with B vita-

mins administered parenterally, either alone or in combination with other forms of therapy, and the majority have shown significant improvement in the neurological symptomatology. There have been no fatal cases. The exponential spread of the disease in early 1993 led to the creation of a program of action, involving the Civil Defense, the Ministry of Public Health, and a group of prestigious scientific institutions in the country, to control the epidemic and promote in-depth research. At the same time, scientific collaboration and other appropriate assistance were requested from the international community. The evaluation, diagnosis, and treatment of patients have required the massive mobilization of human, material, and financial resources. In addition, as a prophylactic measure, vitamin therapy is being administered free of charge to the entire population. The cost of implementing this measure, on top of the cost of treating patients, has entailed the expenditure of several million dollars, which has placed a considerable burden on the national economy, especially at a time when, as noted previously, the country is undergoing tremendous economic difficulties.

No epidemics of *vector-borne diseases* occurred in 1988–1992. None of the vaccine-preventable diseases is endemic in the country. There was one reported case of adult *tetanus* in 1991 and four in 1992. As a result of immunization with the MMR combination vaccine, only 14 cases of *measles*, 8 cases of *rubella*, and 6 cases of *mumps* were reported in 1992.

Tuberculosis was the leading cause of death in Cuba at the turn of the century. Even in 1961 it was responsible for 1,051 deaths (a rate of 17.1 per 100,000 population), which represented 2.6% of all deaths and placed it among the 10 leading causes of death. The decrease in incidence to under 10 new cases per 100,000 population during the 1980s diminished the relative importance of this disease as a cause of morbidity in the country. By the beginning of the 1990s, the incidence of tuberculosis had fallen to about 5 new cases per 100,000 population, and mortality from this cause is currently very low.

In response to the *cholera* threat, a nationwide surveillance system was organized, and to date no cases of this disease have been reported. Mortality from *acute diarrheal diseases*, some of which are of infectious origin, had decreased to 3.5 per 100,000 population by 1990. By 1992, these diseases were responsible for only 0.5% of all deaths in the country.

Diseases of the respiratory system, in particular acute, short-course respiratory infections, are by far the most frequent causes of morbidity in the country. Although

most cases are relatively benign and the fatality rate is very low, the high incidence of these diseases is nevertheless reflected in missed workdays and in a high number of medical visits. Two-thirds of these visits involve patients under 15 years of age. The total number of doctor visits for this cause was approximately 4.5 million in 1991, of which close to 500,000 were for children under 1 year and 1.2 million were for children aged 1–4.

Two cases of human *rabies* were recorded per year between 1972 and 1975. The number dropped to one case in 1976, and then for the next 13 years (1977 through 1989) no cases were reported. In both 1990 and 1991, one case of human rabies of sylvatic origin, transmitted by bats, was reported. There have been no canine rabies epidemics in recent decades. The rate of *leptospirosis* was 4.9 per 100,000 population in 1990, 10.7 in 1991, and 7.4 in 1992. The disease primarily affects workers in rice fields and other irrigated land and in agricultural crops that harbor rodents.

Between January 1986 and 31 December 1992 a total of 13,462,518 tests were conducted among the Cuban population to detect *HIV infection*, with emphasis on high-risk groups. The cumulative total of seropositive individuals as of the latter date was 886, of whom 161 had developed AIDS and 89 had died. In 1992, 175 HIV-infected persons were detected, which equaled a 0.09% test positivity rate, and 32 people died, making the AIDS mortality rate 0.3 per 100,000 population.

Rates for other *sexually transmitted diseases*, which were high in the late 1980s, have declined. For example, the rate of gonorrhea was 336.9 per 100,000 population in 1990 but decreased to 300.3 in 1991 and 243.4 in 1992. The rate of venereal warts (*condylomata acuminata*) also diminished, from 26.8 per 100,000 in 1990 to 25.8 in 1991 and 22.7 in 1992. Syphilis, however, increased, the rate rising from 86.8 per 100,000 population in 1990 to 93.8 in 1991 and 102.6 in 1992. Studies are currently under way to determine why syphilis has shown a different pattern than the other sexually transmitted diseases, since it was expected that all STDs would decrease as a result of AIDS prevention efforts.

Diabetes mellitus is among the chronic diseases that have become leading causes of death in the country. The age distribution elucidates the diabetes problem. The incidence rate is 0.2 per 1,000 children under 1 year, 1.0 in the 1–11 age group, and 2.1 in the 12–17 age group, but among those aged 18–44 the rate reaches 7.0 per 1,000. Among persons aged 45–59 the rate rises to 41.7, and in those aged 60 and over it is 80.2 per 1,000. In the late 1980s and early 1990s diabetes moved up in

the ranking of leading causes of death, and the rates have remained at more than 20 per 100,000 population since 1988. While the mortality rate from accidents is higher among males, mortality from diabetes is higher in females. In 1990 the diabetes death rate for men was 15.3 per 100,000, whereas for women it was 27.8.

Cardiovascular diseases are the number-one cause of death in Cuba, with acute myocardial infarction accounting for the greatest proportion of these deaths. The crude death rate from cardiovascular diseases rose from 148.6 per 100,000 population in 1970 to 166.7 in 1980 and 201.3 in 1990; in the latter year, the rate was 210.0 for men and 168.4 for women.

Sex differences in mortality in 1991 were most apparent in the category of acute myocardial infarction, with rates of 141.2 per 100,000 men against 104.5 per 100,000 women. In the same year, *chronic rheumatic heart disease* was a more frequent cause of death for women than for men (rates of 2.3 and 1.4, respectively).

In 1992 the death rate from heart disease was 21.3 per 100,000 population in the age group 15–49 years and 1,771.6 per 100,000 in the age group 65 and over—83 times higher. According to figures from monitoring of patients under the family doctor program, which now covers 80% of the Cuban population, 213 out of every 1,000 persons over the age of 60 receive treatment for arterial hypertension.

Malignant neoplasms are the second leading cause of death for all ages. The age-adjusted rates were quite similar in 1980, 1985, and 1990, at 111.2, 113.3, and 116.6 per 100,000 population, respectively. In 1992 the rate declined to 97.0. Between 1988 and 1992 mortality from this cause among men was 27%–29% higher than among women.

The order of frequency of malignant neoplasms by site has changed very little in the past two decades. According to mortality figures, the most frequent site is trachea, bronchus, and lung, with crude rates that have risen from 22.4 and 24.6 per 100,000 population in 1970 and 1980, respectively, to 29.8 and 29.5 in 1990 and 1991. Next in order of frequency is prostate cancer, at rates of 11.8 and 16.4 per 100,000 men in 1970 and 1980, respectively. The rates doubled in 1990 and 1991, rising to 25.8 and 24.9, respectively. The third most frequent site is the breast. Breast cancer mortality rates also rose during the 1980s, from 10.2 and 13.3 per 100,000 women in 1979 and 1980, respectively, to 16.0 and 16.5 in 1990 and 1991. Next in order is malignant neoplasm of the intestine; the mortality rate doubled between 1970 and 1991, rising from 5.8 to 11.0 per 100,000, and displacing the uterus (excluding the

cervix) as the fourth most frequent site of malignancy. Uterine cancer currently ranks fifth, with a rate of 9.3 per 100,000 in 1991.

Traffic and motor vehicle accidents, at a rate of 26 per 100,000 population in 1992, account for the largest proportion of deaths from *accidents* for all ages and both sexes. Such accidents are most frequent during the most active years of life and are far more prevalent among men than women. During the last 6 years, the ratio of male to female deaths from this cause was almost 5 to 1 (rates of 38.2 and 7.9 per 100,000 population, respectively). Falls are the most frequent cause of accidental death among women, with a rate of 17.9 per 100,000 women in 1992—almost three times the female rate of death from motor vehicle accidents, which was 7.4 that same year. Among the oldest members of the population, falls are responsible for significantly more deaths, usually as a result of bronchopneumonia complications.

Deaths from *suicide and self-inflicted injury* decreased slightly from 22.0 per 100,000 population in 1980 to 20.9 in 1985 and 18.3 in 1990, but rose again in 1992 to 19.2. During the period 1988–1992 mortality from suicide was higher (by 19% to 23%) among men than women.

In regard to *oral health*, 2,295,925 people underwent oral health examinations for the first time during 1992; 45.9% of them were 15 years of age or older. Of those examined, 19.1% were found to be in good health, and 5,531 showed signs of possible oral cancer. This diagnosis was confirmed in 146 cases; 27% of the malignancies, regardless of type, were detected at stage 0. A survey carried out in 1989 found a decayed, missing, and filled (DMF) index of 0 in 45.6% of children aged 5–6 years. Under the program to prevent dental caries, topical fluoride treatments were administered to 603,591 children under the age of 11 years, covering 42.2% of the children under 5 and 21% of those 5–11. Fluoride rinses were given to 20,157,422 children between 5 and 14 years of age.

Risk Factors

In general, no major problems have been detected through monitoring for the presence of undesirable inorganic compounds in drinking water. Nevertheless, concentrations of mercury slightly higher than the accepted norm and attributable to natural causes have frequently been found in 10 water sources. In several sources in one mining region (Moa, in the province of Holguín) the levels of chromium often exceed permis-

sible limits. The fluoride content of the water from the principal sources is so low that it offers little natural protection against dental caries.

Cuba imports no toxic waste, but in 1990 an estimated 38,500 tons of hazardous waste required disposal; more than 10,000 tons were confined and 600 were put in protected bunkers. The principal Cuban industries that generate this type of waste are the basic industries, such as steel and metalworking, food, pharmaceutical, light manufacturing, construction materials, and agriculture. Although the sugar industry generates the greatest amount of waste matter, these wastes are not particularly hazardous. The aforementioned industries are the principal users of hazardous materials and are the principal generators of hazardous waste.

Cuba is a highly agricultural country and therefore pesticides are commonly used, with all the risks that this practice entails for the health of agricultural workers and others who may come into contact with these substances. In recent years, considerable headway has been made toward replacing imported chemical pesticides with domestically produced biological products, which should yield both health and economic benefits.

Natural disasters affecting Cuba are generally tropical storms, which strike frequently during the hurricane season, at times causing huge economic losses, as well as deaths, injuries, and damages. The most recent natural disaster occurred on 13 and 14 March 1993, when an intense tropical storm, called the worst storm of the century, killed five people, caused dozens of injuries, and left thousands of victims. It destroyed more than 20,000 homes and resulted in economic losses, especially in the agricultural and construction sectors, estimated at close to US\$ 1,000 million. Cuba has an extremely efficient and well-organized civil defense system, which helps to minimize deaths and injuries in these situations. Although seismic activity is not particularly intense in Cuba, in recent years tremors have been registered with increasing frequency in the seismic zone in the eastern part of the country.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

Because of the country's economic difficulties, the Government is forced to stretch its scarce resources to meet the needs of the population and still maintain the level of investment necessary to continue with devel-

opment efforts, and to do all this while upholding the principles of equity and social justice.

On the economic front, the Government has set the following priorities: development of the tourist industry, as an important source of foreign exchange in the short term; development of the pharmaceutical and biotechnology industries, as a source of foreign exchange and to satisfy national needs; and support for the food program, which is aimed basically at meeting the needs of the population. In addition, the Government has been endeavoring to encourage foreign investment and the formation of partnerships between Cuban and foreign firms under mutually advantageous conditions. These types of investments have grown, especially in 1992 and 1993.

In the social sphere, health, education, social security, and the right to work continue to be emphasized.

In the political realm, an effort is currently under way to enhance the institutions of the State and Government, with emphasis on strengthening the local governments, on the one hand, and the National People's Assembly (Parliament) on the other. The election of members to the Parliament by direct, secret ballot vote in February 1993 marked the culmination of an electoral process with high rates of public participation: 99.6% of those eligible to vote did so, and 92.9% of the ballots cast were valid.

The evolution of the health situation and the development of the National Health System led the Ministry of Public Health to make some important changes in 1992 in the country's health strategy. That strategy is described in the document *Objetivos, propósitos y directrices para incrementar la salud de la población cubana 1992-2000 (OPD-2000)* [Objectives, Aims, and Guidelines for Improving the Health of the Cuban Population 1992-2000]. OPD-2000 defines a public health strategy that emphasizes health promotion and prevention of disease and health impairments, together with enhancement of curative and rehabilitative activities. The aim is to maintain the levels of coverage and quality of care already achieved and to take advantage of the high degree of development of the productive forces in the sector to strengthen the involvement and capacity of society as a whole with regard to transforming the lifestyles and living conditions of various segments of the population.

Key elements of this new strategy are the strengthening of the local level, intersectoral collaboration, community participation, and the adoption of a new, more streamlined, creative, and participatory style of management at all levels of the National Health Sys-

tem in order to achieve better integrated health management. Special emphasis is being placed on strengthening the capacity for health situation analysis at the municipal level, the design of intervention strategies, and monitoring and evaluation of the interventions carried out.

The health strategy proposed for the final years of the century is a response to changes that have occurred in the health status of the Cuban population over the last few decades. This strategy builds upon the level of development already achieved by the country's health services, particularly under the family doctor and nurse program, which now serves 78.5% of the population, including all residents of mountainous regions.

During the 1980s scientific and technological development was consolidated, and considerable impetus was given to primary health care through the extension of coverage by means of a network of family doctor and nurse teams, each of which is responsible for providing health care to 120-130 families (some 600-700 individuals). The comprehensive care these teams provide to their small communities includes health promotion and preventive, curative, and rehabilitative activities, as well as activities to protect the environment and efforts to address solvable social problems. The doctors and nurses who will extend this coverage to 100% of the population within the next 3 to 4 years are currently completing various stages of their training. These family doctor and nurse teams are called on to play a leading role in the health strategy set forth in OPD-2000.

Given the demographic changes Cuba has experienced and the changes that have taken place in morbidity and mortality patterns, the strategy for the future must emphasize health promotion and disease prevention if continued progress is to be made in improving the health status of the population. Nevertheless, the importance of curative care and of rehabilitation must not be underestimated.

The advances being made in the various health fields and the priority that these efforts will continue to receive will provide a firm basis for achievement of the objectives that have been established, such as development of genetic engineering and biotechnology; manufacture of medical equipment; development of the pharmaceutical industry; training and continuing education for health personnel, including programs for the development of more than 35 medical specialties; extension of care for the gravely ill through the expansion of intensive care services; extension of rehabilitation services to polyclinics and first-level hospitals;

and support for scientific research and rapid incorporation of research findings into medical practice, where appropriate.

The National Health System in Cuba is a single, integrated, regionalized, and decentralized system administered by the State, from which it receives its funding. It comprises three administrative levels, which correspond to the political-administrative divisions of the country: the central or national level, the provincial level, and the municipal level.

The national level is represented by the Ministry of Public Health, which serves as the lead agency and fulfills methodological, regulatory, coordination, and control functions. Directly under the Ministry are university centers, highly specialized medical research and care institutions, the medical-pharmaceutical industry union, and firms that market and distribute drugs and medical equipment, as well as one firm that imports and exports drugs and high-technology medical equipment. Also under the Ministry are highly specialized medical care facilities, such as the Hermanos Ameijeiras Hospital and the Frank País Orthopedic Hospital.

The provincial level is represented by the provincial public health offices, which are under the direct financial and administrative authority of the provincial people's assemblies. The principal units that come under the responsibility of the provincial governments are the provincial and intermunicipal hospitals, blood banks, provincial health and epidemiology centers, training centers for mid-level health technicians, and the network of commercial pharmacies and optical shops.

At the municipal level are the municipal public health offices, which are under the financial and administrative authority of the municipal people's assemblies. The units overseen by this level include polyclinics; rural, local, and municipal hospitals; municipal health and epidemiology units and centers; oral health clinics; social welfare institutions for the elderly and the physically handicapped; maternity homes; and other establishments.

Higher-level medical training for physicians, dentists, graduate nurses, and, recently, for graduate health technologists is provided in 22 schools of medicine and 4 schools of dentistry, distributed across 13 provinces of the country. Mid-level medical instruction (training for mid-level technical personnel) is given in 57 polytechnical schools, located in 14 provinces of the country; 23 of these schools are devoted exclusively to the training of nursing personnel.

Organization of Services

Personal Health Care Services

The national health system comprises a network of institutions that are easily accessible and provide coverage to 100% of the population. In 1991 the country had 64,347 hospital beds, for a ratio of 6.0 beds per 1,000 population. Medical care is provided through a network made up of 270 hospitals, 11 research institutions, 423 polyclinics, and the contingent of family doctors located in communities, work places, and schools. In addition, there are 175 health posts, 164 maternity homes, 24 blood banks, and 3 medicinal spas. Oral health care is provided through 166 dental clinics. The social welfare services operate 169 homes for the elderly and 25 homes for disabled persons of various ages and with various types of impairment.

In 1992 there were 1,463,179 hospital admissions, with 13.5 discharges per 100 population. A total of 68,395,504 medical consultations were provided, for a rate of 6.3 visits per capita. Of these consultations 50,191,483 (4.6 per capita) were outpatient visits and 18,204,021 (1.7 per capita) were emergency visits, for a ratio of 2.7 outpatient visits for every emergency visit. These figures are very similar to those for 1991. Of the total number of outpatient visits, slightly over 50% were to family doctors, a greater proportion than in 1990, when the figure was 31.7%. The increase reflects the growing participation of the family doctors in outpatient care for the population.

The indicator "medical consultations per capita" nearly doubled between 1970 and 1986, rising from 3.4 to 6.3, and since then has remained stable. Also since 1986 a trend has been noted toward more outpatient visits and fewer emergency visits. Whereas the former increased from 4.2 to 4.6 per capita between 1986 and 1992, the latter decreased from 2.1 to 1.7. This is a favorable change in the previous trend seen in emergency visits, which between 1970 and 1986 had increased from 0.9 to 2.1 per capita; at the same time, it speaks well of the service being rendered by the family doctors, who have taken responsibility for the bulk of outpatient visits.

In 1992, 1.3 dental consultations were provided per capita, which is higher than the rate of 1.0 recorded in 1980 but is similar to the rate of 1.4 in 1985 and 1990, indicating a stabilization of this indicator. Of the total 13,741,423 dental visits in 1992, 786,544 were for orthodontia, 757,745 were for dental prostheses, and 555,727 were for periodontia or other specialized services.

Dental caries and extractions are the principal reasons for dental visits.

Environmental Services

Cuba's constitution establishes the need for and the obligation of the Cuban people to preserve the environment. The National System for Protection of the Environment and Rational Use of Natural Resources, created on 10 January 1981, comprises various agencies and institutions concerned with environmental issues, including the Academy of Sciences, the Ministry of Public Health, the Ministry of Agriculture, the National Water Resources Institute, the Ministry of Education, and the Ministry of Higher Education.

Drinking water coverage, including easy access, has been extended to 81.6% of the population (8,650,000 people). In urban areas 83% of the population has house connections, while in rural areas 77.8% of the population is supplied with drinking water through one of three types of service: house connections, public service, or easily accessible supply points. Although funding for this sector doubled from the 1970s to the 1980s, there continues to be unmet demand. The number of small towns served with drinking water increased from 343 to 1,098 between 1980 and 1990 (1.1 million people). In the rural sector as a whole, the population served more than doubled, climbing from 250,000 to 550,000 persons during the same period.

Water quality control programs are carried out by the Ministry of Public Health, the National Water Resources Institute, and the local entities responsible for operating water supply systems. Generally speaking, drinking water quality improved tremendously during the 1980s, as a result of the construction of several drinking water treatment plants in the largest cities, the extension of chlorination to more than 90% of the water supply systems, and the strengthening of both sanitary inspection mechanisms and efforts to protect water sources.

Sanitary excreta disposal is available to 96% of the urban population and 68.2% of the rural population. In urban areas, 39.1% of the population has sewerage. However, this percentage does not reflect the true sanitation situation of the population, since all homes in areas without sewerage have individual systems for the collection and treatment of wastewater. There are 15 sewage treatment plants in the country.

In urban areas, 98% of the population has access to ecologically sound methods of solid waste management. All urban settlements and large rural communi-

ties throughout the country have had solid waste collection and disposal services since the 1970s. Solid wastes are disposed of in sanitary landfills. There are 25 such installations and 378 refuse dumps with systematic treatment and periodic cleaning that meet the minimum essential requirements.

The country has a system for regular atmospheric monitoring that has been operated for more than two decades by the Institute of Meteorology, as well as an air quality monitoring network in human settlements, which is under the responsibility of the Ministry of Public Health. The results of monitoring up to 1990 show a trend toward increased concentrations of primary air pollutants in some areas of Havana as a result of emissions from fixed sources and motor vehicle exhaust.

Health Promotion

The goal set by national authorities of achieving better health conditions by the year 2000 implies reducing morbidity from chronic noncommunicable diseases and the health problems associated with violence of all types, which in turn implies addressing the factors that shape that violence. In order to accomplish this, health promotion efforts with an intersectoral and participatory approach must be intensified. The health sector's main agents in these efforts are the family doctor and nurse teams, who carry out health promotion activities directly in the community with individuals and families, in accordance with OPD-2000.

A comprehensive, intersectoral health promotion project is currently being carried out in the province of Cienfuegos with the collaboration of PAHO. This project will provide valuable local health system experience. A similar project is being implemented in the *municipio* of Caimanera, located in the province of Guantánamo.

Health Research

Four areas remain health research priorities for the 5-year period 1991-1995: assessment and improvement of the health level of the population; protection of groups at risk; reduction of morbidity and mortality from the specific conditions that most affect the population; and introduction of new means and methods of diagnosis and treatment.

As part of the process of organizing the national effort in the priority areas, scientific-technical foci have

been created which are engaged both in research and in application of the results. One of the first such foci has been organized in the area of biomedicine. It includes centers engaged in vanguard research in biotechnology and genetic engineering, production of drugs, and production of medical equipment, as well as the inputs necessary for these activities, working in collaboration with those in charge of applying research findings in medical practice.

Social and Community Participation

An important feature of the National Health System has been active community participation, which allows needs to be identified, action to be taken, and the community to play a part in health management. The primary channels for community participation are social and community organizations, which focus on specific areas and are closely linked to the various levels and institutions of the national health system.

Among the mechanisms for community participation are the semiannual health assessment meetings conducted by the family doctor and nurse team with the population they serve. At these meetings, conclusions are drawn regarding health conditions in the community and measures are taken to address the problems identified or to improve existing conditions. Also semiannually the populations of the electoral districts meet with their elected representatives to the People's Assembly, at which time community health problems are frequently discussed and solutions are proposed and agreed upon.

Intersectoral Collaboration

The fact that the provincial and municipal health subsystems are subordinate to the organs of local representative government permits close linkage of health activities to the other departments and agencies in the local areas, which imparts an intersectoral approach and gives control to the community. The local level is the most suitable setting for intersectoral action in regard to health.

At the national level there is also operational interaction between the Ministry of Public Health and entities in other sectors, such as the National Sports and Recreation Institute, the Ministry of Education, the Ministry of Transportation, the State Committee on Labor and Social Security, the Ministry of Culture, the National Commission on Social Preparedness, the

Academy of Sciences, and others, which facilitates decision-making and action at the highest level.

Available Resources

Human Resources

In 1992 there were 46,860 registered physicians, or 43.3 per 10,000 population. There were 18,503 family doctors (17.1 per 10,000 population), 20,771 specialists, and 13,994 physicians in training for some specialization. Among the family doctors, some are completing training in a specialty, and others are already specialists. In 1992 there were a total of 8,057 dentists, or 7.4 per 10,000 population. That same year, nursing personnel in the country numbered 74,035, or 68.4 per 10,000 population; 5,474 of these nurses had a university degree. Regular university training leading to an undergraduate degree in nursing was begun in 1987. In 1990 the admission of mid-level personnel began to diminish, although the program will continue and nurses will be graduated throughout the period (1995) with a view to fulfilling development plans and meeting the growing demand for primary health care through expansion of the family doctor and nurse program.

In 1991 the country had 51,830 health technicians, or 48.9 per 10,000 population, working in more than 20 specialty areas. Fewer of these personnel are being trained in recent years due to the coverage extension achieved by the network of institutions of the country. The capacity of the training centers will continue to be utilized to upgrade the skills of technical personnel.

Cuba also has a network of experts in electrical medical instruments, made up of 280 university-trained specialists and 1,300 technicians and skilled workers. The value of this network can be measured by the low proportion of defective equipment, which is less than 8% of the total of 102,000 medical, laboratory, and dental instruments in the country. The network's average response time is 2 days.

Financial Resources

The only source of funding for the health system is the State budget, which rose steadily from 1960 until the last 2 years, in which it declined 0.6%. Spending by the State public health system increased during the period 1975–1990 as a consequence of growth in the

coverage and complexity of the network of health units, the introduction of more advanced medical technology, and the rapid rise in the number of qualified human resources. In 1975 the system was spending 32.73 pesos per capita, but by 1990 the amount had risen to 98.56; it decreased to 97.11 pesos per capita in 1991 and to 95.99 in 1992.⁴ Spending on public health amounted to 7% of the national budget, the second highest proportion in the service sector, behind education. The primary care level accounted for 29.4% of the total expenditure on medical care in 1985 and 36.9% in 1992. Costs of hospitalization, on the other hand, made up 61% of the total in 1985 but decreased to 53% in 1992. Amounts spent on hospital care have tended to remain relatively constant, whereas spending at the primary care level has tended to increase moderately.

In 1986 hospitals began to implement a cost accounting system, since they receive the greatest share of public health spending. The appropriate methodology for this system was developed by the National Accounting Office. Implementation of the system has required raising the level of economic knowledge of the

medical personnel, administrators, and workers in the hospitals.

Extrasectoral Resources

Because health has been a priority of the Government for the last three decades, other social sectors, especially those most closely linked to health—education, food, labor, social security, etc.—have utilized a significant proportion of their resources to benefit the health of the population. Nevertheless, the current national situation makes it essential to rapidly increase the mobilization of resources from both external sources and internal sources, at the national and local levels, to fund health actions. In Cuba's case, the principal problem relating to the mobilization of resources for health is not the need to mobilize sufficient political will or to articulate private and public institutional resources, as is the case in other countries of the Region. Rather, the problem pertains to the mobilization of resources from other sectors within Cuba to further health objectives, especially at the local level, and, above all, to the mobilization of resources from outside the country. The latter is an important aspect to be addressed in the cooperation offered to Cuba by PAHO/WHO and other international organizations, in and outside the United Nations system.

⁴One Cuban peso is equivalent to approximately one U.S. dollar at the official 1993 exchange rate.

DOMINICA

GENERAL HEALTH SITUATION AND TRENDS

The Commonwealth of Dominica is a republic within the Commonwealth of Nations. The President, who has some executive functions, is the head of state. The Head of the Government is the Prime Minister who appoints the Cabinet which, in turn, is responsible to Parliament. The capital is Roseau.

Dominica is part of the Lesser Antilles, and it is located between the French islands of Guadeloupe to the north and Martinique to the south. The country covers 750 km², making it the largest English-speaking eastern Caribbean island.

Dominica lies in the hurricane and tropical storm belt. Hurricanes devastated the island in 1979, 1980, and 1989, completely reversing a modest economic recovery.

The country's economic, social, and environmental conditions—measured by income, education, sanitation, and health services indicators—have improved in recent years. GDP has increased substantially, from US\$ 75.6 million in 1984 to US\$ 145.5 million in 1991; per capita income in 1991 was US\$ 208.

Agriculture is the mainstay of the economy. In 1992, its contribution to the GDP was 24.4%, down from 30.0% in 1988 and 26.7% in 1990. In addition to traditional crops (bananas, coconut products, and citrus) other diversified economic activities and agroindustrial enterprises are being pursued. The country's dense forest cover and flowing rivers are a magnet for tourists; growth in tourism was significant during 1990–1992. The Government has undertaken structural adjustment policies as a way to scale down the public sector while stimulating the development of the private industrial sector.

English is the official language, and it is spoken and understood by everyone, but 90% of the population uses French Creole in everyday speech. School enrollment is high, with approximately 15,000 children attending primary school and 3,247 students enrolled in secondary schools. The adult literacy rate is 70%.

Population

According to the 1991 census, the country had 71,794 inhabitants, a decline of 3.5% from the previous census (1981). The proportions of men and women were approximately equal. A high proportion of the population (28.9%) lives in the capital city and environs. In 1991, the age group under 15 years old was 35.0% of the total, the age group 15–64 years old was 55.4%, and the age group 65 years old and older was 9.6%. According to the 1991 census results, there was an average of 353 persons per 100 households, as compared with 426 during the 1981 census. Dominica is the only Caribbean island with a native Carib community, approximately 3,000 members of which live on a 15 km² reserve on the east coast.

The birth rate has remained fairly constant during the past decade—23 live births per 1,000 population in 1981, 20 in 1986, and 24 in 1991. There were 1,710 live births in 1991; 20.2% of these births were to mothers under 20 years of age.

Records indicate that there has been an annual net emigration of approximately 1,500 persons.

Mortality

Throughout the last 10 years, the crude death rate has been around 6 per 1,000 population. A total of 518 deaths were reported in 1991, for a death rate of 7.2 per 1,000. Of these, 62 (12.0%) were assigned to signs, symptoms, and ill-defined conditions. The most frequent cause of death was heart disease, with 140 deaths, 26 of which were due to hypertensive disease. The second leading cause of death was malignant neoplasms, and diabetes mellitus was third. Chronic diseases are clearly the most important causes of mortality in Dominica (see Table 1).

In 1988–1991, the main reasons for visits to the district medical officer were skin rashes and infections, eye infections, common colds and other upper respiratory tract infections, diabetes, hypertension, and arthritis and joint pains. The five leading causes for ad-

TABLE 1
Ten leading causes of death: number of deaths, percentage of total from defined causes, and rate per 100,000 population, Dominica, 1991.

| Rank | Cause (ICD-9) | Deaths | % ^a | Rate |
|------|--|--------|----------------|------|
| | All causes (001–E999) | 518 | 100.0 | 722 |
| | Symptoms, signs, and ill-defined conditions (780–799) | 62 | 12.0 | 86 |
| | Defined causes | 456 | 100.0 | 635 |
| 1 | Heart disease (390–429) | 140 | 30.7 | 195 |
| | (Hypertensive disease, 401–405) | (26) | (5.7) | (36) |
| 2 | Malignant neoplasms (140–208) | 86 | 18.9 | 120 |
| 3 | Diabetes mellitus (250) | 35 | 7.7 | 49 |
| 4 | Selected diseases of the respiratory system (480–519) | 27 | 5.9 | 38 |
| 5 | Cerebrovascular disease (430–438) | 20 | 4.4 | 28 |
| 6 | Selected diseases of digestive system (530–579) | 18 | 3.9 | 25 |
| 7 | Certain conditions originating in the perinatal period (760–779) | 14 | 3.1 | 19 |
| 8 | Transport accidents (E800–E848) | 11 | 2.4 | 15 |
| 9 | Selected diseases of circulatory system (440–459) | 10 | 2.2 | 14 |
| 10 | Diseases of blood and blood-forming organs (280–289) | 9 | 2.0 | 13 |
| | Other defined causes (Rest) | 86 | 18.9 | 120 |

^aPercent by cause based on total deaths from defined causes.

Source: Ministry of Health Statistical Unit.

mission to the medical wards of the main referral hospital were hypertension, diabetes, alcohol-related problems, cerebrovascular diseases, and heart failure.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

There were 1,710 live births in 1991. The incidence of low birthweight during 1992 was 7.7% of births.

The infant mortality rate, which had been reported as 107.3 in 1960 and 45.1 in 1970, declined from 28.1 in 1974 to 16.0 in 1991, and to 14.0 in 1992; 71% of the deaths in 1988–1992 occurred during the neonatal period. The reduction of infant mortality is probably due to a decrease in fertility, to the professional care of pregnancies and deliveries, and to the broad coverage of child care programs including well-baby clinics.

Mortality in the age group 1–4 years old has shown a decline, and is holding at a rate of 1 per 1,000 population. Of the total number of deaths, the proportion that occurs in children under 5 years of age declined from 14.6% in 1976 to 10.0% in 1984 and 5.7% in 1991. In 1988–1991 the five leading causes of death for 1–4 year olds, in descending order of importance, were: certain conditions originating in the perinatal period (ICD-9, 760–779), congenital anomalies (740–759),

selected diseases of the digestive system (530–579), selected diseases of the respiratory system (480–519), and sudden infant death syndrome (798.0).

The nutrition unit reports that 1.6% of children aged 0–59 months had mild to moderate malnutrition, and less than 0.1% had severe malnutrition at some time during 1992. Obesity occurred in 7.7% of these children.

An oral health survey in 1989 among 12-year-olds revealed that 70% of them have had one or more cavities; the DMF index (decayed, missing, and filled teeth) for 12-year-olds was 2.5. Eighty-three percent of 12-year-olds had some gingivitis or periodontal disease. A 1992 survey found a DMF at age 12 of 2.9.

Adult Health

In 1991, the leading causes of death in the young adult population were accidents and cancer, with 79% of deaths by accidents occurring in males. In the age group 35–59 years old, cardiovascular diseases were the main causes of death; high blood pressure and its complications are most common. A 1987 study of 1,281 adults revealed a total of 252 persons, or 19.7%, with hypertension; prevalence was higher among females (23.5%) than males (14.0%).

Diabetes also is a major cause of morbidity, affecting 5% of the adult population. More than twice as many females as males are registered as diabetics at the

health centers; 40% of the registered diabetics are also hypertensive.

The principal neoplasm sites diagnosed as causes of death in 1991 among males were the prostate (15%) and stomach (14%); among women, breast (14%) and uterus (8%) were the most frequent. The incidence of cancer of the lungs, colon, and rectum is extremely low.

There were no maternal deaths from 1987 to 1990; one maternal death occurred in 1991.

As of December 1992, 73 HIV positive persons (52 males, 21 females) have been diagnosed, of which 23 have died of AIDS. The age group 30–34 years old is the most affected, accounting for 30% of the total.

Health of the Elderly

The elderly population is growing. Of all deaths registered in 1991, 66% were in persons 60 years old and over. Heart disease, cancer, diabetes, and cerebrovascular diseases are the main causes. Blindness, a leading disability among the elderly, is increasingly the result of chronic glaucoma and diabetic retinopathy.

Diseases and Health Impairments

There are still vectors of public health importance, including rodents, that threaten the health of the population. The most important vector is the *Aedes aegypti* mosquito. *Dengue* serotypes 1, 2, and 3 are endemic to Dominica, but since the epidemic of type 1 in 1977–1978 there have been only sporadic cases of dengue fever. Between 1988 and 1992 only two cases were reported, both in 1992.

Typhoid fever is no longer a major problem. There were two major epidemics, one in 1977–1978 and the other in 1981, with rates of 76.7 per 100,000 population in 1977, 67.9 in 1978, and 103.9 in 1981. During 1988–1990, a total of 22 cases were reported. In 1991, a total of 10 cases of typhoid fever were reported at a rate of 7.1 per 100,000. One case was reported in 1992 and five cases had been reported by mid-1993. A major intervention program initiated in 1984 resulted in a decline in acute typhoid fever cases.

There have been no reported cases of *diphtheria*, *paralytic poliomyelitis*, or *neonatal tetanus* during the past decade. The last case of tetanus was in 1978 and the last case of diphtheria was notified in 1975. Between 1988 and 1992 one case of *whooping cough* was reported in 1990.

The last outbreak of *measles* occurred in 1987, with 289 reported cases. Since 1991, blood samples have been taken for confirmation of reported cases. None of the eight cases reported in 1991 was confirmed. There were no reported cases in 1992.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Health Policies and Strategies

Responsibility for providing public health services lies within the Ministry of Health and Social Security. Policy decisions for the health services are made by the Minister on the advice of senior technical officers and the Permanent Secretary, who has responsibility for the Health Department's daily administrative matters.

The Government of Dominica is committed to ensuring every citizen's good health, and has accepted primary health care as the main strategy for achieving this goal. The Government aims to ensure that the population receives appropriate basic health care, and, to this end, will endeavor to provide such care to the underserved, the poor, mothers and children, school-children, the elderly, and other priority groups. Special attention will be paid to specific health problems with important social and economic impact, including mental disorders, sexually transmitted diseases, teenage pregnancies, typhoid fever and acute diarrheal disease, diabetes, and hypertension.

Organization of Services

Personal Health Care Services

Infrastructure. The health care delivery system is composed of the following four levels of care, listed in ascending order of complexity of care and extensiveness of facilities: Type I clinic, Type III health center, Polyclinic, and the National Referral Hospital.

The health services have a decentralized organization, and multidisciplinary district health teams that have responsibility and authority for program execution have been established. The country is divided into seven health districts, and each district is served by one major Type III health center, usually four to seven Type I health clinics, and a multidisciplinary health team. The Type I clinic, which is the smallest unit at the peripheral level in the community, delivers services that are closely integrated with the community, in-

cluding maternal and child health services, health education, diabetes and hypertension monitoring, common diseases treatment, and referrals of more serious problems to the next higher level, the health center. Clinics are located in the main villages; each serves a minimum population of 600 within a radius of 5 miles and is staffed by a primary care nurse. A referral system from one level of care to the next is in place and a district vehicle and ambulance are available.

The Type III health center offers a wider range of services, and constitutes the district's administrative headquarters. It is designed to function as a Type I clinic that provides primary care services for the population in its immediate vicinity and higher level care to a total population of 7,000 or more, as well as referrals to the next level of care, the Polyclinic.

Health services are provided at the district level by a team of health personnel assigned to the health district. Services at the health center are provided by a resident medical officer, a family nurse practitioner, a health visitor, a primary care nurse, a district nurse/midwife, a dental auxiliary, a pharmacist, and an environmental health officer. In each health district, the resident medical officer functions as team manager/leader. Program delivery and team functions are set by established norms and standards, and also are supported by various manuals of procedure. A health information system for supporting local programming is functioning. Health program activities include maternal and child health services, which offer limited maternity inpatient care, medical care, and dental health and environmental health services.

The Polyclinic, situated on the Princess Margaret Hospital grounds, provides secondary care support to primary care personnel. Serious problems that require complex care, but that are still treatable on an outpatient basis, are referred to the Polyclinic. The Polyclinic, which houses the hospital's outpatient services (casualty, radiology, physiotherapy, pharmacy) and medical records, was completed in 1990.

The Princess Margaret Hospital, located in the capital, is the main secondary care referral hospital. This institution provides inpatient services for medicine, general surgery, pediatrics, obstetrics, gynecology, ophthalmology, otorhinolaryngology, and psychiatry. Between 1990 and 1992, the number of beds increased from 189 to 195.

Coverage. Primary health care is delivered through 44 clinics, 7 health centers, and 2 district hospitals at Marigot (16 beds) and Portsmouth (30 beds); district hospitals provide minimal inpatient care. Dur-

ing the past 10 years, 28 new clinics have been built, bringing the total of clinics and health centers to 51. All aspects of primary health care have been extended to villages, and medical and dental care services have been instituted at the district level. Maternal and child health services including immunization, family planning, and nutrition increased in coverage.

During 1991, 85% of pregnant women received prenatal care, with 33% attended by the 16th week; 12% were high-risk cases and the average number of visits was five.

In 1991, 93% of infants attended child health clinics, with 68% first attending at 6 weeks. The average number of visits was 10 per child. Through the Expanded Program on Immunization, infants and children receive routine vaccinations for diphtheria, whooping cough, tetanus, measles, polio, and tuberculosis. In 1990, immunization levels were 69% for measles, 94% for DPT, 94% for polio, and 95% for BCG. Rubella vaccination began in 1990.

Patients of all ages are seen by the district medical officer, but most of the clinic users were among the youngest and oldest age groups. More than one-third of all children under 5 years old use the services, as do 20% of persons between 35 and 64 years old. Women are seen more frequently (67%) than men at those clinics.

During the past decade, there has been a marked increase in dental health services, with an emphasis on prevention. In 1992, 9,092 adults (1,302 restorations, 334 extractions) and 7,036 children (1,978 restorations, 4,336 extractions) were treated. The trend indicates a continued increase in the number of patients seen, with restorations and cleaning steadily rising and the number of extractions decreasing slowly. A preschool dental program was launched in 1991, and there is a very active school dental health program.

The reorganization of the health system and, particularly, the primary health care services, have influenced the need and demand for efficient delivery at the main secondary care hospital. Since 1988, the reorganization has focused on strengthening the networking of the two levels and the outpatient services of the main hospital.

The home for the aged located in Roseau provides limited medical care and long-term nursing care for geriatric patients. There also are two smaller geriatric homes, and a private home is under construction. The latter is part of an effort to increase geriatric care by the health system and other social and private agencies, in light of the projected growth of the older population.

The Polyclinic holds specialist clinics in all disciplines with an average of 10 sessions per week and an

average range of 7–29 patients per session. A total of 11,210 cases were seen in 1991—22.1% of all patients were new cases and 77.9% repeat consultations, although this varied by type of specialty clinic. Most repeat consultations were in medicine, pediatrics, ophthalmology, and surgery, while obstetrics and gynecology, and ear-nose-and-throat clinics saw more new cases than repeat cases.

The Polyclinic's casualty department functions as a general walk-in clinic for the population in its vicinity and provides emergency care to cases referred from the district—23,409 patients were seen in 1991, with a daily average of 64 patients; of patients attending, about 45% were trauma cases.

During 1992, there were 8,504 admissions to and 8,334 discharges from the Princess Margaret Hospital (including the Psychiatric Hospital). The average length of stay was lower in 1992 (5.9 days) than in 1986 (8.0 days), while bed occupancy was higher, 88.5% in 1992 compared with 70.7% in 1986.

Since 1984, there has been a gradual shift from domiciliary deliveries to the main hospital. In 1984, 53% of deliveries took place in homes/health centers and 47% at Princess Margaret Hospital. During 1991, approximately 20% of all births were handled by domiciliary midwifery services and 80% at Princess Margaret Hospital.

Environmental Services

The Department of Environmental Health within the Ministry of Health is the leading agency in all matters pertaining to environmental health, and responsibilities are distributed among various public bodies and the central Government.

A private entity, the Dominica Water and Sewage Company, provides potable water throughout the island. Sewage disposal, which is confined to the cities of Roseau and Canefield, is still handled by the Roseau Town Council and the Ministry of Housing, but will be taken over by the Dominica Water and Sewage Company. The provision of latrines falls under the responsibility of the Ministry of Health. The central Government has taken over responsibility for garbage collection and disposal from the city councils of Roseau and of Portsmouth.

Most of the water consumed in Dominica is surface water. Eighty-six percent of the total population is served by piped water. In urban areas 50% of homes are served through house connections, and 50% have reasonable access to public standpipes (1991); in rural

areas, 18% of the population is served through house connections and 60% by public standpipes; 22% of the rural population has no access to the public water system (1991).

Water quality is generally good in the rivers, except during flood periods. There have been problems associated with cultivation and cattle-raising in watershed areas. Most watersheds are privately owned, and regulations controlling cultivation in watershed areas are not strictly enforced. Water treatment is carried out through sedimentation and chlorination; 70% of the water reportedly is chlorinated, although not regularly. The water mains date to the early 1900s and the Dominica Water and Sewage Company needs to undertake a massive water mains replacement program.

The infrastructure for sewerage disposal in Dominica also needs improvement. Roseau's sewers are 75 years old and insufficient, resulting in overloading and frequent backup in manholes. No sewage treatment is provided. Several sewerage outfalls are located right off the beach in the downtown area.

Only Roseau and Canefield are served by public sewers, a coverage that is estimated at 13% of the urban population. In urban areas, 52.5% of the population is served by septic tank and latrine; in rural areas, 48.5% is served by sanitary means of disposal of excreta; 44% of the population is reported to have no access to excreta disposal facilities. The fact that an estimated 60% of households along the west coast are without excreta disposal facilities is a major concern. Because the ground is so rocky, it is difficult or impossible to construct pit latrines or septic tanks, and most households in the small villages simply dump their liquid waste into streams or the sea.

Untreated industrial effluent also is directly discharged into rivers that flow into coastal waters. The resulting contamination poses serious public health hazards to those who use the water for drinking, bathing, or recreational purposes. It also damages marine habitats and threatens the island's recreational and aesthetic value.

Despite recent improvements in solid waste collection and disposal in Roseau and along the west coast, only an estimated 40%–45% of households on the island are served with adequate waste collection and disposal. Waste management problems are likely to intensify with any increase in population or in industrial activity. In many rural areas, solid waste is dumped into local streams and in areas of high population density.

In recent years, the solid waste volume has increased. The central Government has established a sat-

isfactory collection service for the two cities of Roseau and Portsmouth and villages along the west coast; the solid waste is dumped into a sanitary landfill. In other villages, solid waste is disposed of at communal open dumps near the sea or randomly along roads and streams.

Vector control activities take up much of the Government's efforts, with high risk areas such as Tarish Pit, Girandel, and Scots Head receiving fortnightly interventions. Dominica is implementing an integrated vector control project in two pilot areas.

In 1991, the vector control team charged with *Aedes aegypti* control conducted 40,160 household inspections and found 4,674 to be infested (11.6%). Water tanks were found to be important breeding places—of 9,712 tanks inspected, 20% were positive.

Regular monitoring and inspection of food and food handling premises, meat inspection, and improvements in the personal hygiene of food handlers are significant activities of the Environmental Health Department.

Environmental protection and the rational use of natural resources have been given increased importance within Dominica's overall development strategy. This was reflected in the Government's launching of the "Years of Environment and Shelter" campaign in 1989–1990, which aimed at educating the general public regarding key environmental issues.

A major portion of Dominica's public sector investment program for 1991/1991–1993/1994 addresses water supply and sewerage services. Water and sewerage projects amount to US\$ 15 million, or 24% of the projected public sector investment program expenditure for that period. These include the construction of several new rural water systems and an integrated water and sewerage development project for Roseau.

Health Promotion

The Ministry of Health's Health Education Unit is staffed by two health educators and one graphic artist communications officer. For the past 3 years, the main focus areas have been drug abuse and prevention, HIV/AIDS/STD prevention, cholera awareness and prevention, tuberculosis, hypertension, diabetes and heart disease, and disaster preparedness. Efforts have relied on public campaigns, such as ones aimed at cholera and drug abuse; lectures; discussion groups; community and school education sessions; seminars and workshops; and use of radio, press, and television.

Available Resources

Human Resources

In December 1992, there were 34 doctors working in Dominica (4.7 per 10,000 population); 28 were employed by the Government (20 at the main hospital, 8 in primary care) and 6 worked solely in private practice. Of the 34 doctors, 12 were specialists. Only one of the primary care doctors was a national. Currently, Dominica is trying to establish incentive programs to encourage nationals to work and remain in rural areas.

In 1992, there were eight family nurse practitioners; nurses represent about two-thirds of all human resources in health. In 1992, there were 233 registered nurses (32.4 per 10,000), 90 of which were primary care nurses working in the districts and 143, secondary care nurses. There were 81 nursing assistants, 21 of whom were employed in psychiatric care.

The number of dentists has doubled from three in 1985 to six in 1992; in 1992, there were eight dental auxiliaries.

Other available health personnel in 1992 included 21 pharmacists, 20 laboratory technologists, 4 radiographers, 2 nutritionists, and 1 physiotherapist. The Government had 17 environmental health officers and 2 medical statistics officers.

Financial Resources

The country's health service is financed from the consolidated fund (92%), social security (6%), and user fees. Capital works are generally financed through loans and grants. In 1991–1992 the total budgetary allocation for health expenditure was EC\$ 19.8 million, or 13.1% of the total national budget. Of the total, 43% goes for hospital services and 22.5% to primary care services.

Government health services are mainly provided free of charge to the population, while the remaining health services are provided on a fee for service through the private sector. Typically, revenue generated through user fees collected at Princess Margaret Hospital comprises less than 2% of recurrent spending by the Government on the sector. Social security contributors receive free hospitalization in return for a contribution from the social security scheme to the Government. Since 1990, social security has been contributing 1.2% (increased from 0.8%) of the insurable wage to the Government to defray the cost of medical care; in 1991, this amounted to EC\$ 2.4 million.

DOMINICAN REPUBLIC

GENERAL HEALTH SITUATION AND TRENDS

The Dominican Republic takes up two-thirds of the island of Santo Domingo, which it shares with Haiti, and extends for 48,442.23 km². For political and administrative purposes the country is divided into three regions (southwest, southeast, and Cibao) and seven subregions, which comprise 29 provinces and the National District (the metropolitan area surrounding the city of Santo Domingo, the national capital). There are eight health regions, which correspond to the seven subregions and the National District, and 30 health areas, each of which corresponds to a province. The national constitution currently in effect establishes a civilian, democratic, and representative system of government.

Health and Living Conditions

Up to the mid-1970s, the country's economy revolved around traditional export products (sugar, coffee, cocoa, and tobacco), which made up 60% of the total value of the country's exports. Sugar production accounted for 70% of industrial employment and absorbed more than 45% of the economically active population (EAP). In 1980, the total value of agricultural exports dropped by 21.5%, and sugar exports alone decreased 9.9%. This decline was offset by growth in service-sector activity, particularly in free-trade areas and the tourism industry. A consequence of these changes has been an explosive growth of the cities and of their marginalized populations. This entire process has been accompanied by efforts to redefine the role of the State and privatize the production of goods and services traditionally supplied by the State.

The application of the development model described above, coupled with the country's deepening external debt and public spending policies, had a destabilizing effect on the economy. With the erosion of real wages and the decline in social spending (education, health, and social welfare) that accompanied the introduction of economic adjustment measures in 1984, national income became increasingly concen-

trated (families in the lowest income bracket received 2.1% in 1984 but only 0.8% in 1989, whereas the share of families in the highest income bracket increased from 33.2% to 44.2% during the same period). At the same time, the proportion of poor people rose from 47% of the total population in 1984 to 57% in 1989, while the proportion of indigents climbed from 16% in 1984 to 30% in 1989. Other estimates indicate that the situation had deteriorated even further by 1991, when 70% of the population fell below the poverty line. The real minimum wage decreased 42.3%, the unemployment rate rose 27%, and per capita caloric intake fell 7%.

The 1987–1990 period saw major macroeconomic imbalances, which were manifested in a rapid and sustained rise in prices, repeated currency devaluations, huge increases in the money supply, and an exacerbation of the external and public-sector deficits, which aggravated the arrears in payment of the external debt.

Between 1980 and 1990, the price of the family basket of basic goods increased by more than 400% and the consumer price index rose 467%, while the minimum wage went up only 29%. In 1989, the minimum wage covered the cost of just 35% of the products that make up the family basket.

In 1990, 39.4% of the population (2,826,028 people) was living in the most impoverished areas of the country (22 of the 30 provinces). The National District (the most developed area) had 33.6% of the total population, distributed unevenly across its area (64.23% of the dwellings were located on 18.62% of the land). In 1991, a demographic and health survey (ENDESA-91) was conducted of urban and rural areas and of the eight health regions, using two questionnaires that together were administered to some 14,000 households throughout the country. Data from that survey were used to classify the households according to an index of satisfaction of needs that took into account quality of housing and overcrowding, access to services, possession of goods, availability of fuel for cooking, and educational level. In 33.7% of the households surveyed, the majority of basic needs were not being met, in 38.4% they were being met to some extent, and in 28.0% they were being mostly met. In the province with the worst conditions, only 0.6% fell into the group

in which most basic needs were being met, whereas 89.0% were in the group with mostly unmet basic needs.

During the 1986–1990 period, increasing poverty and the widening of inequalities and inequities were manifested in an increase of diseases that are preventable through health education and the application of hygiene and sanitation measures (diarrheal diseases, typhoid and paratyphoid fever, and acute respiratory infections), pulmonary tuberculosis, and nutritional deficiencies. The proportion of malnourished children under 5 years old found to be suffering from low height-for-age and low weight-for-age was 2.9 and 3.2 times higher, respectively, in the provinces with the worst living conditions (Independencia, Samaná, and Bahoruco), as compared to the National District, which enjoys the best living conditions in the country. In a similar comparison, acute malnutrition was found to be 10.7 times higher, although the prevalence was lower (3.2% versus 0.3%). Urban-rural differences also were observed: the proportion of malnourished children was almost twice as high in rural areas (26.3% versus 14.6% for urban areas). The 1986–1991 period saw an increase in chronic malnutrition in health regions III, IV, VI, and VII, which are in the provinces with the worst living conditions. In 1991, 75% of the total malnourished population was concentrated in the four areas with the worst living conditions, where 39.4% of the total population lives.

An analysis of acute diarrheal diseases and acute respiratory infections in relation to living conditions, reveals a rising trend in all population strata between 1986 and 1991, although these problems are greatest among the groups with the worst living conditions. In 1990, the rate of acute diarrheal diseases was 2.5 times higher and that of acute respiratory infection was 3.4 times higher in the stratum with the worst living conditions as compared to the stratum with the best living conditions. The findings of ENDESA-91 were similar.

It is important to point out that there are major differences and inequities between areas. For example, in the National District 57.2% of the reported cases of tuberculosis (999) occurred in the four health areas in which the population with the worst relative living conditions is concentrated. In these four areas, the rates were up to 11 times higher than the rates registered in areas with better conditions.

In 1989 and 1990, according to official sources, diarrheal diseases and acute respiratory infections were among the five leading causes of hospital inpatient deaths, and in 1992 they ranked first and second, respectively.

Population

The country's population is expected to continue growing at an annual rate of about 2.0% for the 1990–1995 period. In mid-1993, the total population was estimated at 7.6 million (3.9 million males and 3.7 million females). Projections for 1993, borne out by ENDESA-91, indicate that the age group 0–14 years old makes up 36% of the population; the 15–64 age group, 60%; and the 65-and-older age group, only 4%. The total fertility rate decreased from 3.7 children per woman during the 1983–1985 period (according to ENDESA-86) to 3.3 children per woman during the 1988–1991 period (according to ENDESA-91). There are substantial differences in fertility among geographic areas and social strata. In 1988–1991, the total fertility rate was 2.8 children per woman in urban areas and 4.4 in rural areas. Similarly, the rate was 2.6 in health region 0 (National District), but was as high as 4.7 in region IV and 5.7 in region VI. Fertility among women with no formal education was twice as high as among university-educated women (5.2 as compared to 2.6). Table 1 shows age-specific fertility rates for the 1988–1991 period.

Since the 1970s, emigration has represented an important survival strategy for the Dominican people. An estimated 10% of the Dominican EAP is working outside the country, especially in the United States of America and Western Europe. According to the Inter-American Development Bank (IDB), in 1984 emigrants sent more than US\$ 300 million back to the country, and in 1988 the World Bank estimated that the amounts sent back by emigrants were equivalent to 36% of the country's exports. A study conducted in April 1993 found that at least 700,000 Dominicans have emigrated in the past three decades, most of them since 1980 and especially since 1985. About 25% of those who emigrate return to the country, and one-third of those who return consider emigrating again. Regarding immigration, the available data indicate that the total number of immigrants is no higher than 300,000.

ENDESA-91 detected high levels of internal migration; 34% of the population was found to have moved at least once and 9% had done so during the 1986–1991 period. The survey found that an average of 100,000 people per year migrate internally. Urban-to-urban migration predominates, although rural-to-urban shifts remain strong. The National District attracts more migrants than all other regions, but regions II and V are beginning to draw larger numbers. This trend is explained by the concentration of tourism and

TABLE 1
Age-specific fertility rates, per 1,000 women, by area,
Dominican Republic, 1988–1991.

| Age groups | Whole country | Urban areas | Rural areas |
|------------|---------------|-------------|-------------|
| 15–19 | 88 | 71 | 123 |
| 20–24 | 210 | 177 | 282 |
| 25–29 | 175 | 157 | 216 |
| 30–34 | 116 | 110 | 128 |
| 35–39 | 57 | 46 | 83 |
| 40–44 | 12 | 3 | 30 |
| 45–49 | 11 | 5 | 22 |

Source: IEPD-PROFAMILIA/ONAPLAN/IRD. Dominican Republic. *Encuesta demográfica y de salud, 1991.*

industrial free-trade areas in these regions (of the free-trade firms, 65% were established between 1980 and 1988; 71% are concentrated in Santiago, La Romana, and San Pedro de Macorís, provinces located in health regions II and V).

Mortality

The information available for the analysis of mortality comes from the death records kept by the data processing unit of the Secretariat of State for Public Health and Social Welfare. In order to show the evolution of mortality patterns in the country during the 1986–1990 period, a list of six major categories based on the International Classification of Diseases, Ninth Revision (ICD-9), was adopted. The Secretariat estimates an underregistration of mortality of 51.3% overall, with higher or lower rates depending on the health regions or areas concerned. Underregistration is highest in the most underprivileged regions (IV, VI, and VII) and in rural areas. During the 1986–1990 period the proportion of registered deaths attributed to signs, symptoms, and ill-defined conditions represented a mean of 16%. Only 28% of the deaths registered in 1990 were certified by the attending physician.

The death rate in 1989 was estimated at 6.8 per 1,000 population, although the registered death rate was 3.5 per 1,000 population. Mortality rates (based on registered deaths) tended to remain stable during the 1989–1990 period. Urban deaths made up 70.8% of all deaths in 1986 and 74.9% in 1990, although it should be kept in mind that underregistration of deaths is higher in rural areas.

Specific death rates from diseases of the circulatory system, the leading cause of death, tended to remain stable, as did death rates from malignant neoplasms.

Communicable diseases ranked third among the causes of death, and death rates from this cause tended to rise.

A more detailed analysis of proportional mortality shows that acute myocardial infarction (410) ranked as the leading cause of death throughout the period. In 1990, ill-defined intestinal infections (009) ranked second; cardiac dysrhythmias (427), third; chronic liver disease and cirrhosis (571), fourth; and motor vehicle traffic accidents (E810-E819), fifth. An analysis of mortality in relation to living conditions shows lower specific rates for these health problems as living conditions worsen. If the area with the best living conditions (the National District) is excluded from the analysis, a general trend is observed toward increasing specific rates for communicable diseases as living conditions worsen. Table 2 shows the trend of reportable diseases for the period 1985–1990.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

At the end of the 1986–1990 period, deaths of children under 1 year old constituted 17% of all registered deaths (as compared to 23% in 1985). The registered infant mortality rate fluctuated between 19.0 and 15.1 deaths per 1,000 children under 1 year. (Owing to problems with the registration of births, this population group was used as the denominator.) Underregistration of infant deaths averaged 61%, ranging from 32.1% to 86.6%, depending on the region. The extent of underregistration is obvious when these figures are compared with data from studies carried out through direct population surveys. For the 1988–1991 period, ENDESA-91 found a rate of 46.0 per 1,000 for the country as a whole, and the National Center for Research on Maternal and Child Health calculated the rate at 73.5 per 1,000 in some impoverished areas. Death records show a substantial decline in infant deaths from conditions originating in the perinatal period (from 839.8 per 100,000 in 1986 to 499.0 per 100,000 in 1990), and an increase in deaths from communicable diseases (from 562.7 per 100,000 in 1986 to 695.6 per 100,000 in 1990).

In the group aged 1–4, the mortality rate has remained stable, with this group accounting for 5% of all recorded deaths in 1990. In 1991, the leading causes of death in this age group were intestinal infectious diseases, protein-energy malnutrition, measles, and bron-

TABLE 2
Trends of reportable diseases, Dominican Republic, 1985–1990
(rates per 100,000 population).

| Disease | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
|-------------------------------|---------|---------|---------|---------|---------|---------|
| Diarrhea | 1,679.4 | 1,347.7 | 1,679.3 | 2,414.3 | 2,971.9 | 2,972.2 |
| Pulmonary tuberculosis | 36.4 | 39.9 | 36.4 | 33.1 | 38.0 | 50.9 |
| Tetanus | 1.1 | 0.7 | 1.1 | 1.5 | 0.9 | 0.8 |
| Soft chancre | 26.4 | 24.9 | 32.5 | 16.0 | 55.6 | 11.2 |
| Syphilis | 154.0 | 174.7 | 152.8 | 132.7 | 110.5 | 92.1 |
| Gonorrhoea | 193.2 | 157.4 | 156.3 | 140.7 | 115.8 | 90.9 |
| Hepatitis | 29.4 | 23.7 | 44.7 | 42.5 | 43.1 | 48.8 |
| Dengue | ... | ... | ... | 3.2 | 8.1 | 1.7 |
| Brucellosis | ... | ... | ... | 0.7 | 1.2 | 2.2 |
| Encephalitis | ... | ... | ... | ... | 5.1 | 9.5 |
| Acute respiratory infections | ... | ... | ... | 2,762.4 | 5,235.9 | 4,558.1 |
| Typhoid and paratyphoid fever | 16.6 | 16.8 | 27.8 | 37.6 | 54.1 | 71.6 |
| Leptospirosis | ... | ... | ... | 0.2 | 0.6 | 0.4 |
| Meningitis | ... | ... | ... | 0.2 | 3.7 | 2.9 |
| Rubella | ... | ... | ... | 4.1 | 4.0 | 4.2 |
| Mumps | 11.1 | 13.5 | 16.2 | 19.1 | 21.9 | 27.8 |

Source: Data processing unit, Secretariat of State for Public Health and Social Welfare, Dominican Republic.

chopneumonia caused by unspecified microorganisms. Unspecified and unknown causes account for a larger proportion of registered deaths in this age group than any of the specific causes. There has been no significant change in cause-specific rates in the 1–4 age group. External causes were responsible for 31% of the deaths of children aged 1–4.

In the 5–14 age group, specific mortality rates for the 1986–1990 period remained at approximately 30 deaths per 100,000 population per year. External causes account for the largest proportion of deaths in this group, with an average rate of 9.4 deaths per 100,000 population and considerably higher figures among males.

Adolescent Health

In 1991, it was estimated that of persons aged 10–19, 619,501 were living in extreme poverty, 393,805 were members of the EAP, 58,000 were homeless, 1,000 were street children, 1,748 had assumed the role of head-of-household, and 34,810 were living in farming communities. Child abuse was reported by 100% of the informal-sector children who were included in one study. Several nonrandom studies have revealed high levels of drug use (between 41.5% and 71.8%) among street children.

In 1991, 20.9% of a representative sample of 621 pregnant women were under 20 years of age. These adolescent mothers were more apt to be short, had less

access to health care services, and gave birth to low-birthweight babies more frequently.

Adult Health

During the 1986–1990 period, registered mortality among adults remained at around 1.0 per 1,000 population. Among adult males, the leading cause of death is external causes. The death rates from this cause are 5–6 times higher among males than among females (70.9 per 100,000 men, as compared to 11.9 per 100,000 women in 1990). In the female population, diseases of the circulatory system are the leading cause of death, the rates being similar to those for males (17.3 per 100,000 males and 14.5 per 100,000 females in 1990).

Health of Women

Women's participation in work outside the home has increased substantially, especially in the industrial free-trade areas and in agroindustry, although they work under adverse conditions. Women working in the free-trade areas in the Dominican Republic earn the lowest hourly wages of all workers in all Caribbean basin countries; they are denied the right to unionize; they are forced to work overtime, sometimes without pay; they lack job security; and they are subject to continual violation of their reproductive rights through

mandatory pregnancy tests, to which they must submit in order to get or keep a job. Women's entry into the labor force has not been accompanied by the socialization of services to facilitate the process; neither have there been any modifications in the social functions of men and women, and women are still expected to assume full responsibility for running the household. Several studies conducted among the female workers in the free-trade areas of the country suggest an increase in the frequency of harm to women's reproductive health after they begin to perform this type of work.

Maternal mortality was 4.8 per 10,000 live births in 1986, 5.9 in 1988, and 4.5 in 1990. Toxemia of pregnancy accounted for between 25% and 30% of maternal deaths. Hemorrhage of pregnancy ranked second as a cause of maternal death, followed by abortion, which was responsible for 11% to 15% of the maternal deaths recorded.

Workers' Health

Statistics on occupational diseases for the last 5 years show a predominance of poisoning by heavy metals (830 cases, 34%) and lumbago caused by exertion (420 cases, 17.2%), followed by dermatoses (385 cases, 15.8%), respiratory problems (282 cases, 11.6%), hypertension (310 cases, 12.7%), and noise-induced hearing loss (11 cases, 0.4%); other diseases accounted for 200 cases. Occupational accidents are underreported owing to the administrative decision to decentralize workers' compensation payments; as a result, the provinces no longer send accident reports to the central office. In 1991, a total of 2,432 occupational accidents were reported, with a fatality rate of 0.6%.

Diseases and Health Impairments

Vector-borne Diseases

During the 1985–1990 period, the incidence of malaria showed a tendency to decline, leveling off somewhat in 1987 and 1988. In 1991, the incidence fell to 377 cases (out of 343,491 blood samples examined), with no deaths. In 1992, morbidity increased (698 cases out of 299,549 samples examined, with 11 deaths), owing to a reactivation of foci associated with the work of immigrants in hotel construction projects in the eastern and northeastern regions of the country. The poorest stratum of the population has the highest

frequency, and the risk of malaria is greatest in health region IV (comprising border provinces).

Dengue has not been a serious problem. There have been sporadic outbreaks of dengue fever in urban areas, the most recent one occurring in 1991, when 24 cases were confirmed serologically. Underreporting of morbidity is considerable. During the last decade, serotypes 1, 2, and 4 were in circulation. The entire country is infested with *Aedes aegypti*, and *Aedes albopictus* was recently detected in the capital.

There are four known schistosomiasis foci in the eastern portion of the country, in urban and periurban areas where environmental sanitation is deficient and the populations' habits increase the possibility of exposure. Although the endemic area remains small, it has slowly but steadily spread.

Filariasis is a public health problem in the southeastern region.

Vaccine-preventable Diseases

The Dominican Republic has had no cases of poliomyelitis since 1987. Cases of neonatal tetanus have occurred in recent years in rural and marginalized urban areas. Whooping cough and diphtheria have shown a slow, sustained decline. Rates of tuberculous meningitis ranged from 1.2 to 2.9 per 100,000 children under age 5 during the 1980s. In 1992 active case-finding detected 32 cases (half confirmed bacteriologically), 28 of which were found in the National District, bringing the rate to 7.7 cases per 100,000 children under 5. The incidence of measles was 200 per 100,000 population in 1980 and 102 in 1992, with periods of low incidence in between (10 per 100,000 population for the 2-year period 1986–1987). Since 1988, the incidence has climbed steadily, and an epidemic began in the second half of 1991. Rates increased in all age groups, and measles became the third leading cause of death in the age group 1–4 years old in 1991. Children under 1 experience the highest rates (772 per 100,000 children under 1 in 1992), followed by preschoolers (347.1 per 100,000 children under 5 in 1992). The most recent outbreaks have occurred mainly in the poor areas of the country's two major cities and in the *municipios* of the southeastern and central regions.

Cholera and Other Intestinal Infectious Diseases

As of May 1993, no cases of cholera had been reported in the country. Acute diarrheal diseases

showed a rising trend during the 1985–1990 period. Reported episodes increased from a rate of 1,679.4 per 100,000 population in 1985 to 2,972.2 in 1990. Diarrheal diseases were either the leading or second leading cause of doctor visits, hospitalization, and emergency visits throughout the period. They also figured among the 10 leading causes of hospital inpatient deaths, showing a tendency to rise in proportional terms. By 1992, diarrheal diseases had become the leading cause of hospital inpatient deaths. Between 1985 and 1990 the reported rates of typhoid and paratyphoid fever rose from 16.6 to 71.6 per 100,000, while the rates of viral hepatitis increased from 29.4 to 48.8.

Chronic Communicable Diseases

Available data on tuberculosis suffer from considerable underreporting. The number of suspected cases of the disease increased from 36.4 per 100,000 population in 1985 to 50.9 in 1990, although the number of cases reported by the control program indicated rates of 36.4 and 38.1 for the same years. In 1992, the number of reported cases totaled 3,487, of which 1,745 were concentrated in the National District. It is difficult to tell whether this concentration is due to greater risk or is a reflection of the fact that the National District has better and more diagnostic and treatment facilities. Of the total number of cases reported, 72.1% occurred in the 15–49 age group, but the highest rate was in the over-50 age group.

The prevalence of leprosy decreased from 83 patients in treatment per 100,000 population in 1980 to 14 in 1992. In 1990, the incidence was 3.3 new cases diagnosed per 100,000 population; one out of every four patients diagnosed was under 20 years of age, and only 7% showed disability of grade 2 or more. All cases were diagnosed clinically, bacteriologically, and histopathologically, and all patients received multidrug therapy.

Respiratory Diseases

The rates of acute respiratory infection were the highest of all the reportable diseases during the 1988–1990 period, and showed a tendency to increase (2,762.4, 5,235.9, and 4,558.1 episodes per 100,000 population in 1988, 1989, and 1990, respectively). This cause climbed from fifth place among the leading reasons for doctor visits in 1989 to first place in 1992.

Acute respiratory infections were among the 10 leading causes of emergency visits and hospitalization, and tended to move up in the ranking; by 1992, they were the second leading cause of emergency visits and the leading cause of hospitalization. Similarly, they moved from fifth place among the 10 leading causes of hospital inpatient deaths in 1989 to second in 1992.

Zoonoses

The principal reservoir of wildlife rabies is the mongoose, and dogs are the chief reservoir for the urban form. Cases of canine rabies in recent years have occurred in periurban and marginalized areas of small cities and sometimes in rural areas. In descending order, regions V, I, VI, and IV have the highest incidence. There were four cases of human rabies in 1986, two in 1991, and one in 1992.

The rates of leptospirosis were 0.2 per 100,000 population in 1988, 0.6 in 1989, and 0.4 in 1990.

AIDS and Other Sexually Transmitted Diseases

As of 24 April 1993 the cumulative total of AIDS cases stood at 1,883. Underreporting is estimated at between 50% and 75%.

Of the cumulative cases, the male/female ratio was 2.3:1. Young heterosexuals make up 36.0% of those affected; intravenous drug users, 1.7%; and homosexuals and bisexuals, 12.0%. Blood transfusions have been associated with 9.5% of the cases among females and 3.2% among males. Perinatal transmission accounted for 0.9% of the cases in 1987, 2.0% in 1990, 0.6% in 1991, and 0.5% in 1992. Cases associated with transmission through contaminated blood made up 5.6% of the cases in 1987, 2.8% in 1991, and 6.4% in 1992. The provinces of Valverde, Puerto Plata, San Pedro de Macorís, Monte Cristi, and El Seibo have the highest rates.

The seroprevalence of HIV infection among women of childbearing age ranges from 0% to 1.5%, with no significant changes over time. Among blood donors, the prevalence of infection is 0.5%. Out of 115,666 blood samples from persons over the age of 15 (general population) screened during the first half of 1992 by a private agency, the prevalence of infection was 0.2%. Among sex workers and patients of sexually transmitted disease clinics, the prevalence of infection found in 1992 was 7.0% and 8.2%, respectively—figures much higher than those reported by earlier studies.

During 1985–1990, the rates of other sexually transmitted diseases were nearly the highest among all the reportable diseases (only acute diarrheal diseases and acute respiratory infections showed higher rates). The rates of syphilis were 152.8 per 100,000 population in 1987, 132.7 in 1988, 110.5 in 1989, and 92.1 in 1990; those of gonorrhea were 156.3, 140.7, 115.8, and 90.9; and those of soft chancre were 32.5, 16.0, 55.6, and 11.2, for the same years.

Nutritional and Metabolic Diseases and Deficiencies

Studies carried out in 1986 and 1991 among children under 5 found that 9.6% of infants aged 6–11 months were suffering from chronic malnutrition (low height-for-age) in 1986; the figure had risen to 17.0% in 1991. In the same age group, 3.2% were suffering from acute malnutrition (low weight-for-height) in 1986 and 1.4% in 1991. Among children aged 12–23 months, 21.6% showed low height-for-age and 2.9% showed low weight-for-height in 1986; the figures for 1991 were 21.4% and 1.2%, respectively. Anemia accounted for 8.4% of doctor visits in 1989 and 4.9% in 1992.

Accidents and Violence

Between January and April 1993 the National Police reported a total of 882 accidental or violent deaths—397 from traffic accidents, 268 from homicide, 109 from suicide, and 108 from drowning—and the number of such deaths was projected to rise to 2,646 per year. Injuries accounted for 24.6% of all emergency medical visits in 1989 and for 15.6% in 1992.

Arterial Hypertension

Between 1989 and 1992, arterial hypertension increased in proportional terms (from 2.9% among all causes of doctor visits in 1989 to 4.4% in 1992), and accounted for 7.0% of emergency medical visits in 1992.

Risk Factors

Lifestyle-related Risks

A national household survey (n=3,000) carried out in 1992 found the following prevalences of substance

use: alcohol, 66.5%; tobacco, 21.2%; over-the-counter drugs, 15.0%; stimulants, 6.9%; sedatives, 5.5%; inhalants, 2.5%; marijuana, 2.0%; and cocaine, 1.1%. In late May 1993 there were 387 known addicts in the country, mainly users of crack, cocaine, marijuana, alcohol, or a combination of substances. No data are available on the proportion of addicts treated privately. The total quantities of drugs seized throughout the country during the 1988–1992 period were: 581.3 kg of cocaine and 16.1 kg of marijuana in 1988–1989; 1,167.9 and 175.3 kg in 1989–1990; 2,163.3 and 500.8 kg in 1990–1991; and 1,446.1 and 398.9 kg in 1991–1992. During the last period 23,908 marijuana plants also were seized.

Risks in the Physical Environment

The country has no regular services for sanitary disposal of excreta and wastewater nor any refuse collection services, and the coverage and quality of drinking water services are low, especially in deprived urban areas.

Contamination by industrial and mining wastes, improper and unregulated use of pesticides, and deforestation are serious ecological problems. Wooded areas have shrunk to a mere 12% of the country's total area, and the annual rate of deforestation is 0.6%. Air and atmospheric pollution have increased in recent years, owing to the proliferation of industrial and domestic electric power plants, which are noisy and are powered by all types of fuel. The increase in the numbers of these plants is a result of the country's energy crisis.

Risks in the Work Environment

The risks in the work environment come about because of poor health and safety conditions and the use of hazardous substances. The use of such substances is widespread, and no effective control measures are in place. In recent years, the expansion of agroindustry has brought on an increase in the use of pesticides, which poses a great risk for farm workers, particularly given the lack of knowledge about the consequences and proper use of these chemicals. The situation has been aggravated by the suspension of activities of the laboratory operated by the Secretariat of Agriculture, which supported pesticide monitoring and control efforts.

Natural Disasters

Because of its geographic location and climate, the Dominican Republic is continually exposed to floods, droughts, hurricanes, and tropical storms. In 1986, more than 12,000 people suffered injuries or damages as a result of tropical storms. During the first half of 1993, the eastern and central portions of the country experienced floods, which affected some 10,000 people and left more than 2,500 people homeless.

Housing

According to 1990 estimates of the housing shortage, more than 600,000 dwellings were uninhabitable, 800,000 needed repairs, and only 500,000 were found to be adequate. In peripheral areas of the major cities, in addition to the lack of water supply, sanitation, and refuse collection services, housing units are constructed of refuse material on lands prone to flooding, and there is a high degree of overcrowding.

Food Contamination

The presence of ciguatera has been confirmed in the Dominican Republic. Microbiological testing of food samples (mainly water, milk, and milk products) by the National Public Health Laboratory found one-third of the water samples to be unfit for consumption. In tests to detect contamination in nonrandom samples of milk and milk products, the monthly percentage of positivity ranged from 15% to 35%.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

General Policies

During 1984 and 1985 a process of economic stabilization was pursued, and, beginning in 1986, an effort was made to stimulate economic growth by means of large infusions of public investment, mainly in construction. In addition, the conditions created by the currency devaluation in the mid-1980s were consolidated; the devaluation was undertaken as a way to encourage a transition to a service-based economy, mostly tourism and the industrial free-trade areas.

Public investment increased from 6% of the GDP in 1985 to 11.2% in 1987, which resulted in economic growth of 7.9% in the latter year.

The Government's structural adjustment policy that began in 1990 basically involved currency and fiscal measures aimed at ensuring greater revenues, but that did not affect the distribution of those revenues. This was manifested in the structure of spending, which shifted from current expenditures to capital expenditures. In the social arena, priority was given to construction (housing, drinking water supply systems, and sewerage), to the detriment of education, which had been a top priority in the distribution of spending, and health, which dropped from second to third priority during the 1987–1991 period. At the same time, there were imbalances between the increase in investment in construction and spending on machinery and equipment and operating expenses, which led to operational problems.

Population Policies

Since their inception, the country's population programs have been geared toward regulating fertility through family planning and to improving maternal and child health and family welfare. The National Council on Population and Family (CONAPOFA) has set three major objectives: a demographic component that calls for systematic action to reduce the high population growth rate, a health component that is related to maternal and child health, and a family welfare component that basically rests on the principle that each family has the right to decide on the number and spacing of its children. Under the national health policy for the 1992–1995 period, the objective of the population policy is to achieve a balance among the number of inhabitants, the ecological space available, and economic growth, in order to ensure sustained progress toward social well-being. Action in this area will be afforded high priority, until the birth rate falls to a level compatible with national development. The policy calls for giving particular attention to the country's most densely populated areas and to the areas most affected by immigration.

Health Policies and Strategies

The health policy that guides the activities of the Secretariat of State for Public Health and Social Welfare, which is contained in the document "Política Na-

cional de Salud, 1992–1995” (National Health Policy, 1992–1995), endorses the primary health care strategy. The document acknowledges that health is a fundamental human right and establishes that all Dominicans should have free and equal access to the means to exercise that right. It also establishes the State’s responsibility to ensure that health activities give priority to underprivileged and high-risk groups. The main policy lines established are democratization, universal health care, equity, humanistic modernism, efficiency, and effectiveness. The principal strategies for implementing the national policy are decentralization and deconcentration, community participation, intrasectoral and intersectoral coordination, and development and management of knowledge.

Major challenges must still be overcome before achieving the necessary structural changes that will allow the sector to be organized and to operate so as to effectively carry out the policies defined. The National Health Commission, established by presidential decree in 1991, in a report to the President of the Republic identified several of the problems, including: inadequate managerial capacity in the public institutions of the health system and excessive centralization of available resources and decision-making authority, insufficient funding for the sector, absence of basic mechanisms for intersectoral coordination, lack of intrasectoral coordination between the public and private subsectors, major difficulties in regard to the population’s access to health services at the local level, limited development of the primary health care strategy as part of the process of comprehensive health development, poor quality of hospital services, insufficient quantities of drugs and other supplies and inefficient use thereof, and lack of incentives to motivate human resources in the health sector.

In April 1993 health authorities launched a project aimed at modernizing the health sector.

In terms of training and utilization of human resources, major efforts have been made in continuing education for health and teaching personnel, analysis of the dynamics of the health work force, training and updating, curriculum development, and integration of training and service. However, these efforts have not been accompanied by the definition of a clear-cut national policy. The State has been unable to supply the health services with adequately paid personnel whose remuneration reflects their dedication to their work, the risks to which they are exposed, their level of responsibility, and their investment of time in providing health services. According to the National Health Commission, personnel in all professional categories,

and even those in nonprofessional categories, have been forced to seek their livelihood in other sectors, through multiple job-holding or through emigration.

Although no explicit policy exists on health spending and funds, in recent years there has been a marked trend toward cost recovery by charging users (unregulated “sliding cost-recovery fees”) in government establishments, as well as the expansion of private plans (prepaid health care and insurance plans).

Coverage levels for environmental sanitation and drinking water supply continue to be low, and there is increasing contamination of water sources. Efforts to rectify this situation are hampered by insufficient financing, deficient commercial development and operating capacity of the institutions that comprise the sector, inadequate institutional framework, and lack of specialized personnel.

Disaster preparedness and relief activities are currently being consolidated under the Coordination Office of the Health Program for Disaster Prevention, and regional offices are being established to fill the need for duly organized operational centers to ensure an efficient emergency and disaster response.

In regard to drugs, the national health policy gives priority to reorganizing and strengthening both the Division of Drugs and Pharmacies of the Secretariat of Health and the Program on Essential Drugs, which is responsible for supplying the bulk of the drugs and reagents used by the public health agencies that come under the office of the President. Recent advances in this area include the creation of the national essential drugs list, the development of a supply system, the application of good manufacturing practices, the improvement of pharmaceutical inspections, the development of hospital pharmacies, and the increase in the number of public drug stores. In coordination with the Secretariat of Agriculture, efforts are under way to bolster the production of immunobiologicals for use in humans and animals, to initiate the production of parenteral sera, and to strengthen the Central Veterinary Laboratory as the national reference center for quality control. Tariff measures imposed by the Government affect the development of the national pharmaceutical industry: no tax is levied on finished products, but a 5% tax is charged on raw materials for local manufacture, and a 10% tax is exacted on materials used in the processing of pharmaceutical products.

There are no explicit policies on food and nutrition, resources (physical and special diagnostic resources), research and development of health technology, priority programs and population groups, health promotion, or food safety.

As concerns health legislation, the current health code was enacted some 40 years ago, and existing laws and regulations have lost some of their force through lack of application and enforcement. The country's senate and house of representatives have adopted a national law on AIDS prevention.

Organization of Services

Personal Health Care Services

Infrastructure. The country's health system comprises two sectors, public and private. The public sector is headed by the Secretariat of State for Public Health and Social Welfare, which theoretically covers 80% of the population with health promotion, disease prevention, and social welfare services. The Dominican Social Security Institute (IDSS) provides sickness, maternity, disability, and old-age benefits to wage-earners and a small number of salaried private sector workers. Coverage for the families of IDSS beneficiaries is limited to obstetric care and care for children under 1 year old. The IDSS covers 4.9% of the total population (460,000 workers and beneficiaries). The Institute does not provide unemployment insurance. The Social Security Institute of the Armed Forces and National Police (ISSFAPOL) covers all armed forces and national police personnel and their family members. The private sector is comprised of for-profit and nonprofit institutions. In recent years, nongovernmental organizations working with rural and underprivileged urban populations and with special groups, have notably increased and private plans (pre-paid health care and insurance plans) also have expanded.

The tremendous lack of articulation and coordination that exists among the various institutions and sub-sectors has negative repercussions on the sector as a whole. In terms of financing, establishments operated by the Secretariat of Health and ISSFAPOL are funded primarily through government contributions, with user fees, donations, and international loans representing only a small proportion of the operating funds (between 2% and 16% in 1988). The Government finances the purchase of drugs with funds from the Office of the President channeled through the Program on Essential Drugs; the administration of these funds has been decentralized from the Secretariat. The IDSS is funded through government contributions and payment of fees by employees and workers. The for-profit private sector is financed exclusively through user fees, while the nonprofit sector receives government allocations,

donations, and cost-recovery fees. Nongovernmental organizations are supported mainly by foreign funds.

Coverage. Although in theory the Secretariat covers 80% of the population, independent studies indicate that its true coverage is scarcely 40%. A study conducted in 1989 found that the private sector handled 56% of all doctor visits in the city of Santo Domingo; the Secretariat, 30%; IDSS, 10%; and ISSFAPOL, 4%. In terms of hospitalizations, 50% were in private sector institutions, 36% in institutions of the Secretariat, 10% in IDSS hospitals, and 4% in ISSFAPOL establishments.

The number of outpatient visits to public sector establishments in 1992 totaled 5,812,146, for a rate of 0.8 visits per capita; the total number of hospital discharges was 347,276, or 46.5 discharges per 1,000 population. Major and minor surgeries totaled 130,038, or 1 surgery for every 44.7 doctor visits and every 2.67 hospital discharges. In 1992, a total of 2,099,909 laboratory tests and 247,985 radiography examinations were performed—an almost 100% increase in both cases over the totals for 1991. The statistics on total registered births show some degree of underregistration or late registration of births, given that they indicate 52% coverage by the public sector, a percentage which is higher than that recorded in 1991 (38%), but considerably lower than the figure found by the 1991 demographic and health survey. According to that survey, 64% of all births were attended in public or social security establishments, and 28% were attended in private clinics.

In 1992, children under 1 made 506,260 visits to health services, 21% of which were well-child visits. This figure represents a 79% increase over the number of visits in 1991; in that year, 37% were well-child visits. During the 1987–1992 period only family planning consultations and deliveries showed a rising trend.

Notably high immunization coverage levels were achieved in 1990: 89.9% for polio, 95.7% for measles, 69.7% for DPT, and 68.1% for BCG among children under 1, as compared to levels of 68.2%, 29%, 41.9%, and 42.7%, respectively, in 1988. After 1990, these coverages were 63.4% for polio, 75.3% for measles, 48.1% for DPT, and 73.5% for BCG.

The National Malaria Eradication Service registered an annual blood-slide examination rate of 23.2 for the population in areas in the attack phase (19% of the national population), of 26.2 for areas in the consolidation phase (0.7% of the national total), and 3.7 for areas in the maintenance phase. In 1992, active case-finding detected 60% (420) of the cases, out of 250,397 samples examined.

Environmental Services

Although per capita spending on drinking water has increased, close to 40% of the population still lacks house connections to water supply systems. Even where service exists, it is erratic, and the water supplied is not of adequate quality. As for sanitation, 20% of the population is connected to the public sewerage system, 40% has septic tanks and latrines, which are generally not well-maintained, and the remaining 40% lacks adequate excreta and wastewater disposal services. To address this situation, the Government has approved and funded several large-scale latrine-building projects in high-risk areas, and is currently negotiating with the European Union for the initiation of other projects. Urban sanitation and solid waste collection and disposal services are the responsibility of *municipios*. Practically all cities have problems relating to poor coverage, irregular refuse collection, and disposal of solid waste in open-air dumps. The units charged with administering these services are weak and lack equipment, funds, and specialized personnel. In late 1992, the National District took the first step toward privatization of refuse collection, and a significant improvement was noted in residential areas. The marginalized areas of the major cities have no regular refuse collection services.

Health Research and Technology

According to data compiled by BIREME, the country has 14 health science information units: 4 are hospital-based, 6 are university-based, and the remainder are linked to research institutions, professional associations, the public sector, and international organizations. Of the research units in the country, 76.9% are located in the National District. A national health information network was created in March 1991. Several studies have indicated that most research activities originate at the personal initiative of investigators or in response to the requirements of funding agencies.

Available Resources

Financial Resources

Although in nominal terms public spending on health increased, it actually declined in real and per capita terms, which in 1991 placed it 40% below the 1980 level. As a proportion of the GDP, health spend-

ing has remained the same (1.1% of GDP), whereas as a proportion of overall public spending it increased from 7% in 1985 to 9.5% in 1990, falling to 7.8% in 1991–1992. External resources as a proportion of public spending on health decreased from an average 6.8% during the 1983–1986 period to just 1.9% in 1987–1991. Spending by the Secretariat of State for Public Health and Social Welfare decreased from 85.9% to 64.3% of total spending on health between the periods 1979–1982 and 1987–1990, and then dropped to 55.5% in 1991. The Office of the President of the Republic, on the other hand, increased its share in health spending from 1.8% to 28% and then to 38.4%, respectively, during the same years. As for the distribution of spending by the Secretariat, the ratio of spending on tertiary care services to spending on primary care services increased from 8.7 in 1988 to 11 in 1992. In 1991, total direct spending per doctor visit, bed, and hospital discharge was 60%–70% lower than in 1980.

According to a 1984 survey of family income and expenditure, Dominican families were spending 21% of their income on medical care, and the poorest members of the population were being most adversely affected. Medical services accounted for 42.9% of total spending on medical care, and drug purchases accounted for 45.8%. It was also found that among the wealthiest and the middle-income families surveyed, 25% usually sought health care in the private sector, and even among the poorest families, only half of their total spending on health was in the public sector.

Physical Resources

In 1992, the Secretariat of State for Public Health and Social Welfare had 723 health care establishments distributed as follows according to level of complexity: 587 (81%) rural clinics and medical dispensaries; 79 (11%) health subcenters, health centers, and local hospitals; and 57 (8%) hospitals and tuberculosis treatment centers. Between 1986 and 1992 the overall number of health establishments increased 47%, basically at the expense of rural clinics and medical dispensaries.

In 1992, the IDSS had 1 maternity hospital, 20 polyclinics, and 13 urban and 128 rural outpatient clinics, with a total of 1,168 beds. The private sector in 1990 had 420 establishments with 5,786 beds. These resources were distributed unevenly. In the case of the Secretariat, the poorest regions (I, IV, VI, and VII) had only 15% of the hospitals and 23% of the beds, whereas Santo Domingo alone had 24% of the hospitals and

40% of the beds. In the private sector, 50.7% of the establishments and 69.5% of the beds were concentrated in only two of the provinces with the best living conditions and highest levels of development. The National Department of Laboratories and Blood Banks has 2,000 clinical laboratories (public and private) and 60 blood banks and transfusion services.

Human Resources

In 1991, the Secretariat of Public Health employed 3,598 physicians, 6,868 nurses, and 7,267 health promoters. In recent years, the number of human resources in the public sector has increased. Although information is not available for the private sector, one study revealed that a high percentage (45%) of the physicians who work in private establishments do so on a part-time basis.

In terms of human resource training, the country has 25 universities, 15 of which offer undergraduate degree programs in the health sciences, and some also have graduate and master's degree courses. The num-

ber of university-sponsored medical residencies has risen. At the same time, there has been a proliferation of private training institutions for auxiliary nursing personnel, and programs for mid-level health technicians are being developed and diversified at the university level. Many universities, especially private ones, have launched study programs to train health educators, nutritionists, X-ray technicians, dental technicians, and other technical health personnel.

Drugs and Biologicals

The Dominican Republic has 94 domestic drug production laboratories, two foreign-owned laboratories, and one laboratory affiliated with the State university. The Secretariat of State for Public Health maintains a laboratory for the analysis of pharmaceutical products, but that laboratory is underfunded. The national pharmaceutical industry is oriented basically toward final processing and packaging of imported raw materials. Only rabies vaccine and biologicals for human and animal use are produced domestically.

ECUADOR

GENERAL HEALTH SITUATION AND TRENDS

The Republic of Ecuador straddles the Equator and is bordered on the north by Colombia, on the east and south by Peru, and on the west by the Pacific Ocean. Its land area of approximately 272,000 km² comprises four well-defined geological zones: the highlands, the coastal, and the eastern (or Amazon) regions on the continent, and the Galápagos Islands in the Pacific. The Andes mountains traverse the country from north to south in two parallel chains about 60 to 63 km apart—the Eastern and the Western Range. The capital is Quito, and Guayaquil is the city with the largest population. Administratively, the country is divided into 21 provinces: 10 in the highlands, five in the coastal region, five in the Amazon region, and one corresponding to the islands. The Government is made up of the Executive Authority, consisting of the president of the Republic, the vice president, the cabinet ministers, and the secretary general; the Legislative Authority, consisting of a single chamber of national and provincial representatives; and the Judicial Authority, consisting of the Supreme Court of Justice, the superior courts, and the lower courts and tribunals established by the national Constitution.

Mestizos form the majority of the population, and a sizable proportion (not recently calculated) consists of indigenous peoples living in the highlands and the eastern region, where they form well-differentiated ethnic groups. The official national language is Spanish, and the indigenous population also speaks Quechua.

Health and Living Conditions

According to the 1990 census, 30.8% of the economically active population (EAP, defined as persons 8 years of age and over who engage in the production of goods and services, whether or not they are currently employed) works in agriculture, hunting, and forestry. The principal agricultural products are bananas, rice, cocoa, coffee, sugarcane, cotton, and tobacco.

The median growth in GDP for the period 1980–1991 was only 1.9%—a situation attributable to the drop in oil prices and the suspension of external credit. In 1990, however, the figure rose to 2.3%, and in 1991 to 4.4%.

Inflation reached a high of 75.6% in 1989 and then leveled off in 1990 and 1991 at rates of 48.5% and 48.7%, respectively. In 1990 the minimum wage equaled US\$ 65 per month. There have been strikes in the public sector since 1988, mainly affecting day-care institutions, schools, and health establishments.

Macroeconomic policies have had a negative impact on the Government's budget for the social sector: allocations for education and culture decreased from 29.0% in 1980 to 13.3% in 1991, and those for health went from 6.1% in 1980 to 5.9% in 1990.

In 1990 the total school enrollment came to 1.84 million students. It is estimated that fewer than half the children in poverty-stricken areas manage to finish primary school. Although illiteracy among the EAP declined from 14.8% in 1987 to 9.9% in 1990, 73% of the rural population is unable to read and write Spanish. This problem is found principally in the provinces of Cotopaxi, Bolívar, Chimborazo, and Cañar in the highlands, where there are large concentrations of indigenous population; the provinces of Manabí and Los Ríos on the coast; and the province of Pastaza in the eastern region. The high rates of illiteracy in the rural Ecuadorian highlands are due largely to the fact that the indigenous communities continue to speak their own languages. In these groups the literacy campaigns often fail to reach women, who have less opportunity to learn Spanish than men.

In June 1993 the National Development Council (CONADE) reported that open unemployment was 14% and underemployment affected 50% of the EAP.

Population

According to the 1990 census, Ecuador had a population of 9,648,189; the population estimate for 1992 was 10,700,000. Almost half (49.5%) of the population

tallied in the 1990 census was under 20 years of age, 4.3% was 65 and over, and adolescents (defined as 10 to 19 years old) represented 23.5%. There were 2,436,564 women of reproductive age (15 to 49 years), corresponding to 50.2% of the female population. In 1990 life expectancy at birth was 66 years for the population as a whole and 68.2 years for women. In that same year the urban population represented 55.4% of the total.

Between the 1982 and 1990 censuses, the population grew at an annual rate of 2.2%. The birth rate declined from 35.8 per 1,000 population in 1974 to 25.0 per 1,000 in 1990, and the total fertility rate dropped from 7.1 children per woman in 1965 to 3.7 in 1992.

During the 1982–1990 period, the rate of growth of the urban population was 3.6%, compared with 0.5% for the rural population. Urban growth tends to be associated with migratory movement, which varies from region to region. The highland region (except the province of Pichincha, where the capital is located) has the highest level of emigration, with people looking for job opportunities in various sectors in different areas of the country: agriculture on the coast, oil exploration or colonization of newly opened lands in the east, the tourism industry in the Galápagos Islands, and construction, commerce, and services—mostly in the informal sector—in the metropolitan areas of Quito and Guayaquil.

Mortality

General mortality was 4.8 per 1,000 population in 1992, compared with 4.9 per 1,000 in 1991. In the latter year it was highest in the country's Amazon region, where it reached 21.0 per 1,000, followed by the highlands, where it was 19.7 per 1,000. These figures are not adjusted for underregistration, which is apt to be high in both these regions owing to the large indigenous populations. On the coast the mortality rate was 16.8 per 1,000, and on the islands, 16.9 per 1,000.

In the last 25 years general mortality in Ecuador has fallen by more than half, from 11.4 per 1,000 population in 1966 to 4.9 per 1,000 in 1991. Although the exact magnitude of underregistration of mortality is unknown, it is estimated to be at least 30%. In 1990 there were a total of 50,217 registered deaths. According to the National Institute of Statistics and Census (INEC), the proportion of deaths for which the cause is medically certified was 81.2% in 1992. In 1989 and 1990 ill-defined causes (ICD-9, 780–799) represented 16.7% and 14.3%, respectively, of the deaths from all causes.

In 1980 the leading defined cause of death for all ages combined was intestinal infectious diseases (007–009), which accounted for 16.7% of the total. However, by 1990 this cause group no longer appeared among the five leading causes of death for all ages. In 1990 diseases of the heart (390–429) ranked first and accounted for 13.7% of all deaths from defined causes. Malignant neoplasms (140–208) were in second place, at 11.9% (5,106 deaths); accidents were third, also at 11.9% (5,104 deaths); influenza and pneumonia (480–487) were fourth; and cerebrovascular disease (430–438) was fifth. Conditions originating in the perinatal period (760–779) continued to rank among the major causes of death in 1990.

The leading cause of death for men was accidents, which in 1990 were responsible for 16.0% of total male deaths. Among females, the most frequent causes were cardiovascular diseases (15.5%) and malignant neoplasms (14.3%).

In 1990 deaths in children under 5 years of age represented 22.6% of all deaths.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

According to the INEC, infant mortality fell from 76.6 per 1,000 live births in 1970 to 28.1 per 1,000 in 1991. CONADE has estimated, on the basis of data collected in the 1982 and 1990 censuses, that infant mortality in those 2 years was 56.4 and 51.7 per 1,000 live births, respectively. Marked differences exist between urban and rural areas in the pattern of infant mortality. Using indirect methods, CONADE has estimated that in 1990 infant mortality was 36.3 per 1,000 live births in urban areas and 69.6 per 1,000 in rural areas.

In 1990 there were 13,116 deaths from all causes in the population under 15 years of age, which equaled 26.1% of total deaths. In 1980, on the other hand, the figure had been 25,127, or 44.1% of the total. The decrease was due mainly to a reduction in mortality in the group aged 1 to 4 years, which accounted for 14.4% of all deaths in 1980 but only 6.7% in 1990.

In 1990 the leading causes of death in the group aged 1 to 4 years were intestinal infections (27.3%), influenza and pneumonia (14.6%), and accidents (13%). Among males this last cause ranked second that year, at 14.7%.

Deaths in children under 1 year as a proportion of all deaths fell from 25% in 1980 to 15.9% in 1990, largely reflecting a reduction of 2,085 deaths under the heading of intestinal infections (007–009). In both 1980 and 1990 the three leading causes of infant mortality were perinatal conditions (36.6%), intestinal infections (16.6%), and influenza and pneumonia (10.9%). In 1990 congenital anomalies (740–759) ranked fourth, accounting for 7.8% of all deaths from defined causes.

Even with underregistration, neonatal mortality has clearly increased as a proportion of total deaths from defined causes in children under 1, the figure having risen from 29.8% in 1980 to 36.6% in 1990.

The percentage of deaths among the group aged 5 to 14 years declined from 4.7% in 1980 to 3.5% in 1990. In both those years, the number one defined cause of death for both sexes, considered together and separately, was accidents (E800–E949, E930–E939). Influenza and pneumonia (480–487) was the second leading cause in this age group and malignant neoplasms (140–208) was third.

Health of Adolescents and Adults

Deaths in adolescents (the population 10 to 19 years of age) represented 4.1% of all deaths in 1990 and 4.2% in 1991. In 1990 this group constituted 23.4% of the total population tallied in the census.

Among persons aged 15 to 24 the three leading causes of death in 1990 were accidents (34.5%), homicides (11.9%), and suicides (7.1%). For males considered separately this same order prevailed, but for females in this age group the leading causes were accidents; complications of pregnancy, delivery, and the puerperium; and suicide.

In the group aged 25 to 44 the leading causes of mortality in 1990 were accidents (26.5%), malignant neoplasms (10%), and homicide (5.9%). For men separately, however, homicide ranked second and diseases of the heart were third. For women, malignant neoplasms were the leading cause, followed by accidents and complications of pregnancy, delivery, and the puerperium.

Malignant neoplasms were the leading cause of death that same year in the 45-to-64-years age group, in which they accounted for 26.6% of total deaths, followed by diseases of the heart (14.8%) and accidents (12.5%). For males in this age group accidents displaced malignant neoplasms as the leading cause, whereas for females malignant neoplasms and diseases of the heart were the two leading causes of death,

followed in turn by cerebrovascular disease (430–438), diabetes mellitus (250), and accidents.

In summary, the leading cause of death in youths and adults up to age 44 was accidents. This cause is exceeded only by malignant neoplasms in women aged 25 to 44.

Tuberculosis continues to be a major health problem among young adults. Homicides are quite frequent in males aged 15 to 44, as are suicides among both sexes in the 15-to-24 age range.

Except in men aged 25 to 44, among whom accidents predominate, malignant neoplasms are the leading cause of death in adults. Other important causes of death in this age group are diseases of the heart and—especially in women—cerebrovascular disease and diabetes mellitus.

Women's Health

Surveys of the labor market conducted by the National Employment Institute since 1987 show that poverty can be traced to underemployment and unemployment of heads of household. Unemployment rates are particularly high among women family heads—twice as high as for their male counterparts.

Women who have to take care of a house and also must earn wages outside the home in reality have two full-time jobs, which affects their physical and mental health.

Among women aged 15 to 24 years, the two leading causes of death in 1990 were accidents (E800–E949, E980–E990) and complications of pregnancy, delivery, and the puerperium (630–676). At 17.4% and 12.3%, respectively, these two causes together accounted for 29.7% of all deaths from defined causes in this group. The next two most important causes were suicide (9.7%) and tuberculosis (8.0%) (the latter did not appear at all among the five leading causes of male mortality). Malignant neoplasms were in fifth place.

In the group of women aged 25 to 44, the leading cause of death was malignant neoplasms (mainly of the cervix uteri, breast, and stomach, in that order), which accounted for 18.0% of all deaths from defined causes among women in this age range. In second place were accidents, at 12.0%, and in third place, complications of pregnancy, delivery, and the puerperium, at 10.5%. Diseases of the heart were in fourth place (9.4%), and tuberculosis was in fifth (7.8%).

In women aged 45 to 64 the five leading causes of death in 1990 were malignant neoplasms, at 29.8%; dis-

eases of the heart, 15.3%; cerebrovascular disease (430–438), 9.6%; diabetes mellitus (250), 6.7%; and accidents, 5.8%. Diabetes mellitus did not place among the leading causes for men of this age, but chronic liver disease and cirrhosis (571) did.

Maternal mortality declined from 2.3 per 1,000 live births in 1970 to 1.6 per 1,000 in 1990. In 1989 nearly 50% of all maternal deaths were due to hemorrhages of pregnancy and delivery (26.8%) and toxemia of pregnancy (24.1%). Complications of the puerperium (8.2%) and abortion (7.4%) were other important causes of maternal mortality. The largest proportion of maternal deaths occurred among women who had had zero or only one prenatal visit. Sixty percent of the women in their third or later months of pregnancy who came for prenatal consultations at a Quito maternity center were found to be suffering from iron-deficiency anemia.

In 1990, 70.4% of all births in rural areas were not attended by a health professional, and in the provinces of Cotopaxi, Loja, Esmeraldas, Bolívar, and Chimborazo the proportion was even higher. In 1990 only 13.3% of all pregnant women had a checkup after delivery.

Health of the Elderly

In 1990 the elderly population numbered 418,183, of whom 217,373 (52.0%) were women. In that year deaths in the group aged 65 and over represented 39.4% of all mortality. The leading causes of death were diseases of the heart (390–429), at 25.8%; malignant neoplasms (140–208), 17.8%; cerebrovascular disease (430–438), 10.9%; influenza and pneumonia (480–487), 6.4%; and accidents (E800–E949, E980–E989), 5.1%.

Among the men in this age group, accidents ranked fourth and influenza and pneumonia ranked fifth in 1990, whereas among women influenza and pneumonia was the fourth leading cause and diabetes mellitus ranked fifth, with accidents not appearing as one of the top five causes.

In 1988, the leading causes of hospitalization for the population aged 65 and over, based on discharge data from the Ecuadorian Social Security Institute (IESS), were, in order of importance, prostatic hyperplasia, cataract, heart failure, inguinal hernia, arterial hypertension, diabetes mellitus, cholelithiasis, pulmonary tuberculosis, ill-defined intestinal infections, and other disorders of the biliary tract—that is, the majority were

chronic conditions associated with biological aging. Nevertheless, it is noteworthy that pulmonary tuberculosis and intestinal infections figure prominently among the causes of hospitalization in this age group.

A 1993 study investigated attitudes of elderly persons living in a middle- to lower-class section of Quito. Out of an estimated elderly population of 3,770, 218 were interviewed; 104 (47.7%) felt that their life was unsatisfactory, and most of them attributed their problems either to the economy (54.3%) or to their deteriorating health (39.9%).

Workers' Health

In Ecuador there are a number of public and private organizations working in the field of occupational health. The IESS is the largest of these, although in 1990 it covered only 30.0% of the EAP.

There is significant underregistration of workplace accidents and occupational disease: both the employers and the workers are reluctant to report them, the former because they are concerned that penalties may be imposed and the latter because they are afraid of losing their jobs. The Government exercises little control in this area.

In 1988 the IESS's Bureau of Risks and Benefits recorded a total of 4,345 workplace accidents, 60% of them in the manufacturing industry. The accidents were fatal to 122 workers (2.8% of those involved in accidents). Mortality was highest in the mining sector (9.5%), followed by construction (7.5%), services (6.6%), utilities (4.6%), and agriculture, hunting, and fishing (3.3%).

Pesticide poisoning is also a serious public health problem in Ecuador. The incidence rate reported in 1970 was 0.08 per 100,000 population, while in 1990 it was 3.6 per 100,000.

Diseases and Health Impairments

Vector-borne Diseases

Morbidity from malaria reached its highest level in the country's history in 1990, with a total of 71,670 cases reported and a corresponding annual parasite incidence (API) of 11.5 per 1,000 population. Thereafter the number of cases declined to 59,400 in 1991 (with an API of 9.2 per 1,000) and to 42,746 in 1992 (with an API of 7.2 per 1,000).

Although total malaria cases decreased by 40.3% (28,924 cases) between 1990 and 1992, the number of *Plasmodium falciparum* infections increased from 13,869 in 1991 to 15,970 in 1992. In the latter year, 37.4% of all reported cases of malaria were attributed to *P. falciparum*. Mortality from *P. falciparum* malaria showed an unexpected pattern, with 21 deaths documented in the city of Guayaquil and 6 in the province of El Oro. Studies conducted in 1993 confirmed that *P. falciparum* has acquired grade I resistance to chloroquine.

In 1988, some 800,000 cases of dengue caused by type I virus occurred, the largest such epidemic in the country's history. No cases of dengue hemorrhagic fever have been diagnosed since then. However, outbreaks of classical dengue have been reported in eight provinces, and dengue virus types 2 and 4 were detected in sera taken in 1992 from febrile cases in the provinces of Manabí and Guayas. *Aedes aegypti* was found in 201 localities in 1991 and 226 in 1992. During these 2 years the mosquito's range expanded toward the eastern part of the country, which raises the potential threat that it will spread yellow fever into urban areas. The Ministry of Public Health has launched an intense vector control program and has enlisted the participation of local communities.

Jungle yellow fever is limited to the eastern region of Ecuador. In 1990, there were 14 reported cases, resulting in 7 deaths; in 1991, 19 cases and 12 deaths; and in 1992, 20 cases and 13 deaths. The population groups most affected have been settlers, oil workers, road crews, and merchants, who often go into endemic areas without being vaccinated.

The endemic area for onchocerciasis follows the course of the Santiago and Cayapas rivers in northwestern Esmeraldas province, located in the northern part of the country on the Pacific coast. This area includes 192 communities with an estimated population of 20,000. Prevalence of the disease in these communities ranges from 1.8% to 98.1%, and the risk of those infected becoming blind is estimated at 7.5%. Secondary foci of onchocerciasis have been reported outside Esmeraldas as a result of asymptomatic individuals migrating to the eastern provinces in search of work.

As of 1992 leishmaniasis had been reported in 18 of the 21 provinces. The endemic areas are mainly in the eastern region, where the prevalence rate climbed from 87.9 cases per 100,000 population in 1990 to 105.1 in 1991 and 146.6 in 1992. Cutaneous leishmaniasis is the predominant clinical form.

A serological survey to detect Chagas' disease, conducted in 1982 in the city of Guayaquil, revealed a

2.6% prevalence of human infection, with a higher rate in women (3.4%) than in men (1.3%). Another study, done in the province of El Oro in 1984, showed great variation in prevalence rates between different cantons—from 45.8% in Piñas to 2.3% in Guabo.

As of 1992, 15 of the country's 21 provinces had reported cases of paragonimiasis. This disease is on the rise, especially in the eastern region, where the prevalence went from 2.3 per 100,000 in 1989 to 8.7 in 1991. The American wild boar is the most common reservoir in the country's Amazon region, although the peccary and fox have also been implicated. The Ministry of Public Health carries out prevention programs and provides treatment in the endemic areas while at the same time promoting research at all levels.

Vaccine-preventable Diseases

The last autochthonous case of poliomyelitis transmitted by the wild virus was reported in 1990. It can now be said that the country is at low risk for this disease.

Mortality from measles fell from 558 deaths in 1988 (a rate of 5.6 per 100,000 population) to 102 in 1991 (1.0 per 100,000).

Deaths from whooping cough and diphtheria also declined. There were 89 deaths due to whooping cough in 1989 (0.9 per 100,000 population) and 62 in 1991 (0.6 per 100,000), while mortality from diphtheria fell from 8 cases in 1988 (0.08 per 100,000 population) to zero in 1991.

On the other hand, mortality from neonatal tetanus appears to be on the rise, having increased from 0.3 per 1,000 live births in 1989 to 0.6 per 1,000 in 1991.

Cholera and Other Intestinal Infectious Diseases

Ecuador's first case of cholera was reported in Bañoalto, a fishing village in the province of El Oro, on 28 February 1991. For about 4 weeks thereafter the epidemic was confined to the country's southern provinces, but it then spread rapidly to the rest of the country. The only province spared was Napo, where no cases have been reported. In all, a total of 46,320 cases were notified in 1991 and 31,870 in 1992; the case fatality rates were 1.5% and 0.9%, respectively.

Cholera has mainly affected the population in crowded urban peripheral areas on the coast and the scattered rural population, especially indigenous

groups in the highlands, because of the precarious sanitary and socioeconomic conditions in which they live and certain cultural practices. The chief sources of infection have been untreated water, uncooked seafood, and food and beverages consumed at wakes for indigenous patients who died of cholera. In addition to *Vibrio cholerae* 01, serotypes Ogawa and Hikojima have been isolated, and tetracycline resistance has been verified in several strains. In 1993 there were sporadic localized outbreaks of varying magnitude, principally in connection with festivals and religious activities, including wakes, in indigenous communities.

In 1991 diarrheal diseases were the leading cause of morbidity among the diseases subject to epidemiologic surveillance by the Ministry of Public Health, whose records show that this group of diseases prompted 153,347 medical consultations that year and had caused 13,006 hospitalizations in 1989. Diarrheal diseases are the number two cause of death in children under the age of 1 year and the primary cause in those between the ages of 1 and 4.

Chronic Communicable Diseases

The mortality rate from tuberculosis was 12.9 per 100,000 population in 1985 and 12.2 in 1989. The lowest rates were in the groups aged 30 to 44 years and 45 and over, at 12.0 and 28.5 per 100,000 population, respectively. The pulmonary clinical form was responsible for the largest proportion of tuberculosis deaths (87.6%), followed by tubercular meningitis (14.9%) and other clinical forms of tuberculosis (7.5%).

The incidence of pulmonary tuberculosis was 48.1 per 100,000 population in 1988 and 45.1 per 100,000 in 1992, with variations in the latter year ranging from 6.3 per 100,000 population in Carchi Province to 203.2 per 100,000 in the canton of Sucumbíos in Napo Province. By region, the incidence of this form of the disease was 115.0 per 100,000 population in the east, 42.5 per 100,000 in the highlands, and 41.6 per 100,000 on the Pacific coast.

The incidence of tubercular meningitis declined from 1.1 cases per 100,000 population in 1989 to 0.5 per 100,000 in 1992. The incidence of forms of tuberculosis other than pulmonary or tubercular meningitis was 5.7 per 100,000 population in 1989 and 4.4 per 100,000 in 1992.

In 1984 the national leprosy control program initiated multidrug treatment for all recorded leprosy patients in all the provinces. That year there were 2,399 registered cases, for a prevalence rate of 2.7 per 10,000

population. By 1992 the number had dropped to 575, for a prevalence of 0.5 per 10,000. Based on these most recent figures, it can be considered that leprosy has been eliminated, according to the WHO criterion. However, there are still some areas in the provinces of El Oro, Los Ríos, and Guayas with high transmission potential, where the prevalence is in excess of 1 per 10,000 population.

Acute Respiratory Diseases

In 1990 influenza and pneumonia ranked fourth among the causes of death from defined causes for all ages combined and for persons aged 65 and over, while it was in third place for infants under 1 year and second for children in the 1-to-4-year age group. These diseases were also among the leading reasons for consultations in the population as a whole and in children under 5 years old.

Pneumonia is responsible for 40% of all deaths from communicable diseases. For every eight deaths from acute respiratory infections, four occur in children under 5 years of age, more than half of them infants between the ages of 2 months and 1 year.

According to the records on diseases subject to epidemiologic surveillance by the Ministry of Public Health, in 1991 influenza was the second leading cause of general morbidity, accounting for 23,106 consultations. Based on hospital discharge records of units administered by the Ministry of Public Health, in 1989 pneumonia was the fifth most frequent cause of hospitalization; in 1991 a total of 7,389 cases of pneumonia were treated in hospitals.

In a 1989 survey on population and maternal and child health, 54% of the mothers interviewed said that their children had had from one to three episodes of various types of respiratory problems within a given 3-month period, and 9% reported four or more such episodes. The average number of episodes per year was estimated at 5.6.

Rabies and Other Zoonoses

Human rabies has been on the rise in recent years. The incidence edged up from 0.1 per 100,000 population in 1988 to 0.2 per 100,000 in 1991 and then 0.4 per 100,000 in 1992. The region most affected is the Pacific coast, where the incidence rate was 0.3 per 100,000 in 1991 and 0.5 per 100,000 in 1992. The province of Guayas had the highest rates in the country at 0.3 per

100,000 in 1991 and 0.7 per 100,000 in 1992. Dogs are the principal reservoir of the virus.

In 1992 the incidence of human cysticercosis was 1.0 per 100,000 population. The prevalence of epilepsy associated with neurocysticercosis was estimated at 4.6 per 1,000 cases.

During the period 1988–1992 an average of 137 herds per year were affected by vesicular diseases clinically compatible with foot-and-mouth disease, for a rate of 0.5 affected herds per 1,000. The morbidity rate was 6.8 per 10,000 head of cattle, with an internal morbidity rate of 27.2% and a case fatality rate of 1.7%.

AIDS and Other Sexually Transmitted Diseases

Reports received through the end of 1992 indicated a total of 509 HIV-infected individuals, of whom 249 had full-blown AIDS and 169 had died. The reported annual incidence of HIV infection was 0.6 per 100,000 population in 1989 and 1.4 per 100,000 in 1992.

Nine of the country's 21 provinces had reported cases of HIV infection as of the end of 1992. Of the total cases, 69.7% were in the province of Guayas; in the city of Guayaquil the incidence was 3.5 per 100,000 population in 1990 and 6.6 per 100,000 in 1992.

By the end of 1992, 75.6% of the known cases of HIV infection had been contracted in Ecuador and 24.4% abroad. Although homosexual and bisexual males still constitute the majority of those infected (62.4%), surveillance has documented the increasing importance of heterosexual transmission. Transmission via intravenous drug use is not a problem in Ecuador, inasmuch as it represents only 0.9% of all reported cases. The largest proportion of HIV infections (69.9%) has occurred among the 20-to-39 age group, but there is a trend for infection to appear at increasingly younger ages.

Males represented 80.8% of the HIV-infected population at the end of 1992, although there has been a steady increase in the proportion of infected women, the figure having risen from 4.8% of all infections in 1988 to 19.2% in 1992.

As for other sexually transmitted diseases, the annual incidence of gonorrhea was 52.7 per 100,000 population in 1992, and that of urogenital trichomoniasis was 85.2 per 100,000.

The rate of congenital syphilis was 0.30 per 100,000 population in 1990, 0.16 in 1991, and 0.14 in 1992. On the other hand, that of acquired syphilis (primary and secondary) was 11.6 per 100,000 in 1990, 8.7 in 1991, and 10.2 in 1992.

Nutritional and Metabolic Diseases and Deficiencies

Surveys conducted in Ecuador in 1988 and 1989 revealed that between 30% and 40% of the pregnant women who delivered in hospitals or maternity centers suffered from some form of malnutrition. Chronic malnutrition (low height-for-age) was found in 50% of the population under 5 years of age, general malnutrition (low weight-for-age) in 37%, and acute malnutrition (low weight-for-height) in 4%. The prevalence of chronic malnutrition was highest in the rural highland areas, where it was 66.6%, compared with 37.6% in urban areas on the coast.

Seventy-five percent of the children 6 to 12 months of age and 40% of those from 12 to 24 months are anemic. Vitamin A deficiency has been observed in 13% of children under 5 years old.

The prevalence of diabetes was 2.8% in a 1989 survey conducted in three adult populations (15 years of age and over) in the province of Imbabura.

Cardiovascular Diseases

The National Institute of Statistics and Census registered 8,914 deaths from diseases of the circulatory system (390–459) in 1990, and 9,908 deaths from this cause in 1991, representing 17.7% and 19.7%, respectively, of all deaths in those years.

In 1990 diseases of the heart ranked fifth among the causes of death in the group aged 5 to 24 years, fourth in the 25-to-64 age bracket, and first among those 65 years and over. Cerebrovascular disease accounted for the largest number of deaths among persons over 44 years of age and particularly in the group aged 65 years and over: 1,886 in 1981, 2,697 in 1990, and 2,879 in 1991. Within the cardiovascular disease group, acute myocardial infarction (410) represented 3.2% of total deaths in 1990 and 4.0% in 1991.

Essential hypertension was the fifth leading cause of morbidity in 1985 among all diseases subject to epidemiologic surveillance by the Ministry of Public Health. Prevalence of arterial hypertension in the country's total population over 15 years of age is about 10%, but it varies from 3.5% among the highland indigenous population in the province of Bolívar to 13.3% in the Quito urban population, and possibly even higher in some parts of the province of Esmeraldas, especially in the 35-to-44 age group.

The prevalence of group A streptococcal sore throat in Quito schoolchildren has been estimated at approx-

imately 20%. In 1991 there were 124 deaths from chronic rheumatic heart disease.

Malignant Neoplasms

In 1990 malignant neoplasms (140–208) were the second leading cause of mortality in the population as a whole, accounting for 11.9% of all deaths from defined causes. Among men that year, malignant tumors ranked third after accidents, but they were in second place among women. A total of 5,329 deaths were reported in 1990, and 5,256 in 1991.

According to the National Tumor Registry maintained by the Cancer Society, the most frequent sites of malignant neoplasms in men during the period 1985–1989 were the stomach (31.5 per 100,000), prostate (25.0), skin (21.8), hematopoietic system (10.3), and lung (9.2), and in women they were the cervix uteri (50.2 per 100,000), breast (26.6), stomach (22.3), skin (21.9), and biliary tract (9.2).

In 1990 malignant neoplasms ranked third among causes of death in both sexes in the 5-to-14 age group, fourth in the 15-to-24 age group, second among males aged 25 to 44, and first among females in this last group. The most frequent sites in women were the cervix uteri and the body or unspecified part of the uterus, which represented approximately one-fourth of all cancers in these age groups; the next most frequent were the stomach (151), lymphatic tissue and hematopoietic tissue (200–208), and trachea, bronchus, and lung (162).

In that same year malignant neoplasms were the number one cause of death among women in the 45-to-64 age group and the second leading cause among men. The most frequent site was the stomach, followed by other digestive organs and the peritoneum (150–152, 154–159), the cervix uteri, and the body and unspecified parts of the uterus.

In the population aged 65 and over, malignant neoplasms were the second leading cause of death for both men and women in 1990. The stomach was the most important site, followed by other digestive organs and the peritoneum, the prostate, and the uterus, in that order.

Accidents and Violence

In 1990 accidents ranked second among defined causes of death, accounting for 11.9% of total deaths. Of the accident victims, 76% were male.

The age distribution of the figures for that year shows that accidents were the primary cause of death from defined causes in the population aged 5 to 44; they ranked third in the group aged 45 to 64; and among those 65 and over they were in fifth place.

In 1989 there were 4,854 registered deaths from accidents (E800–E949), 5,043 in 1990, and 5,074 in 1991. Motor vehicle traffic accidents (E810–E819) represented 39.3%, 40.6%, and 43.4% of the totals, respectively, in the 3 years cited. Given the magnitude of the problem, an interagency commission was established in 1993 to formulate an intervention plan aimed at preventing traffic accidents.

In 1990 homicide (E960–969), legal interventions (E970–E978), and operations of war (E990–E999), taken together, were among the top five causes of death in two age groups: persons aged 15 to 24 years (second place, at 11.9%), and persons aged 25 to 44 (third place). The rates were higher among males in both age groups.

That same year suicide (E950–E959) ranked third among defined causes of mortality in the 15-to-24 age bracket, with 181 deaths (7.1% of the total). Among females it represented 9.7% of all deaths from defined causes, and among males, 5.7%. The most frequent means of suicide were poisoning and hanging.

Disabilities and Behavioral Disorders

According to a study of the situation of Ecuador's disabled population conducted in 1981, 12.8% of the population had some degree of physical, sensory, mental, or other impediment, either congenital or acquired.

Tobacco use is believed to be associated with approximately 3,000 deaths a year in Ecuador, or 6.0% of general mortality. In the adult population the prevalence of habitual smoking is 21.6% and the male/female ratio is 2.4:1, while among adolescents the prevalence is 14.9% and the sex ratio of smokers is fairly even. Alcoholism, in turn, has a prevalence rate of 7.7% in the population over 15 years of age.

Oral Health

In 1988 an epidemiologic survey was conducted by the Andean Dental Institute, an agency of the Institute for Health Development Research, in public schools located in 32 cantons. It gathered data on caries, periodontal disease, malocclusion, and other conditions

that are indicators of oral health. The results showed that 96% of the general population had dental caries. Persons aged 14 and older had lost an average of 12.2 teeth from extractions, 18.4% of their teeth had a history of caries, and 41% needed a prosthesis.

More than 95% of the 3,230 children examined were found to have caries, and the average value of the decayed, missing, and filled teeth index (DMF) for permanent teeth in children or young people was 0.7 at age 6 and 5.0 at age 12. Ninety-eight percent of the children had some degree of bacterial plaque, 23% had dental calculus, 38% had gingivitis, and 19% suffered from some degree of malocclusion.

Other Health Problems

There had been an endemic focus of yaws in the Borbón area of the province of Esmeraldas among populations living near the Santiago, Cayapa, and Onzole rivers, but a campaign carried out from mid-1992 until mid-1993 succeeded in bringing it under control. In the first phase of the program, which covered 18 communities near the Santiago river, 1,151 individuals out of an estimated total population of 2,132 were screened and the prevalence of the disease was determined to be 2.1%.

There are 30 known species of poisonous snakes in the country, and snakebite accidents occur in some of the tropical and subtropical areas. During the period 1987–1991 the Gustavo Orcés Herpetology Foundation reviewed 401 clinical histories of cases treated at health units in the provinces of Pichincha (159) and Esmeraldas (242) and found that the case fatality rate for snakebites was 4.5%. In Franklin Tello Hospital, located in the eastern part of the country on the Peruvian border, a total of 73 cases were recorded during the period 1971–1992 and the case fatality rate was 4.1%.

Risk Factors

Risks in the Physical Environment

In Ecuador both solid and liquid urban and industrial wastes are discharged into the rivers. In 1988 the Ecuadorian Institute of Hydraulic Resources found high levels of turbidity and bacterial contamination in the Esmeraldas River due to the dumping of solid waste. Other rivers have similar problems: the Pastaza is being polluted with both solid wastes and industrial effluent; the Guayas, Machángara, and Monjas rivers

receive solid and liquid wastes from the cities of Guayaquil and Quito; and rivers in the province of El Oro have been contaminated with excessive levels of mercury and cyanide by mining activities.

In Quito the lead content in the atmosphere reaches levels double the maximum acceptable limit.

Solid waste collection services handle no more than 40% of the volume produced. The most serious problem is in the city of Guayaquil, where trash is collected from only 49% of the homes.

Natural Disasters and Industrial Accidents

Ecuador is highly earthquake-prone. Although there have been temblors in all parts of the country, the most active seismic zones are the northwestern coast, the area along the Gulf of Guayaquil, and most of the inter-Andean plateau.

Every year there are floods in the populated and agricultural areas along the coast. The severity and geographic extent of the flooding depends on the variable positioning of the cold and highly saline Humboldt Current and also on the occurrence of El Niño, a recurrent climatic phenomenon that brings heavy rains about every 6 years and most recently affected the coastal provinces in 1992.

Landslides have increased in the last decade because of ongoing deforestation and inappropriate land use practices; they cause an annual average of 50 deaths. Improper land use and quarrying activities in the province of Azuay triggered a landslide at the end of March 1993 which dammed up the Cuenca and Jadán rivers, causing 35 deaths and resulting in major financial losses from damage to agriculture, industry, and the highway system. Thanks to disaster preparedness measures, a higher death toll was averted.

Housing and Urbanization

Half the population of Ecuador lives in precarious housing, and there is an ever-widening gap between the rate of new house construction and the growing demand. Many houses have earthen floors, asbestos roofs, and walls made of adobe or sugarcane. Overcrowding is common.

According to the 1990 census, there were 2,009,655 dwellings in the country, of which a sizable portion were without basic services: 37.2% without water supply, 27.7% without wastewater disposal, 56.8% without trash collection, 25.8% without access to sanitary

services, 22.3% without electricity, and 52.4% without bathing facilities.

In Quito slightly more than 30% of the population lives in *tugurios* (densely populated areas in which housing is rented collectively) or in squatter settlements on the outskirts of the city, while in Guayaquil the proportion living in such conditions reaches 70%.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

During 1989–1992 the Government's program was based on the social democratic ideology; it proposed a mixed economic model aimed at harmonizing the social and the economic aspects of development, promoting social and political consensus, and fostering social participation as a means of giving a greater representative voice to the people. However, the critical national socioeconomic situation made it necessary to apply a series of gradual adjustment measures in an effort to resolve the economic crisis while at the same time attempting to minimize the negative impact on people's lives.

A new administration was inaugurated in August 1992, and in its first year it introduced a neoliberal development model characterized by an opening up of foreign trade, an adjustment policy designed to remedy macroeconomic imbalances and stabilize and reactivate the economy, social policies aimed at protecting the groups at greatest socioeconomic risk and providing them with services, and modernization of the State by means of downsizing the bureaucracy, improving and democratizing its management and performance (especially at the local level), and reducing the national debt. The objectives of the Government's Macroeconomic Plan are to curtail inflation rapidly and to shore up the fiscal situation in order to improve the country's international image. In keeping with these goals, the following adjustment measures were put into effect with a view to securing economic and social development and beginning the modernization process: a drastic reduction in public spending; a hiring freeze coupled with job cuts in the public sector; elimination, merging, or privatization of various public and quasipublic enterprises; optimization of the use of nonrenewable resources such as hydrocarbons by eliminating subsidies and setting realistic rates and consumption guidelines for electrical energy; collection of a private sector contribution to the

adjustment in the form of a one-time payment of 0.2% to 0.7% of liquid assets from companies registered with the Corporation and Banking Authority; and establishment of an anti-inflationary exchange system through a sizable initial devaluation which will be offset in the long run by a considerable reduction in the national debt.

These measures have affected the people's quality of life, not only by aggravating existing problems but by creating new ones. Labor strikes are one of the clearest expressions of the social discontent that has been triggered by the prevailing state of living conditions.

Since 1986 the indigenous peoples have become more vocal and have taken a more active stance in the demand for rights. This movement has interrupted productive activities and generated political pressures that have been felt even more acutely than those exerted by the labor movement.

Social Policy

There is increasing recognition of the important role played by the social sectors—education, social welfare, labor, and health—in national development. Nevertheless, many agencies' budgets had cut and, as public institutions, they have had to pare their work forces in an effort to streamline their operations.

Population Policy

The State has declared that access to family planning is a constitutional right of the Ecuadorian people, based on the assumption that availability and access to services in this area will reduce the national fertility rate.

Health Policy

The health policy calls for the strengthening of health services by assigning priority to primary health care and improving hospitals. The strategies that the Government has endorsed are decentralization and regionalization of services, development of local health systems, training and continuing education, research, and the introduction of up-to-date administrative and management systems. In general the health policy of the current administration (1992–1996) is quite similar to that of the previous one (1988–1992). The main difference is that the current economic approach gives

stronger emphasis to economic growth, generation of income, and capital accumulation as opposed to social development and income redistribution.

Priority has been given to social and community participation, but in reality such participation is limited and consists largely of enlisting the population's physical labor and financial contributions for the construction of health units and basic health services.

Organization of Services

The health services are organized into three broad areas: public, private (both for-profit and not-for-profit), and informal. The public subsector comprises the Ministry of Public Health, the Ecuadorian Social Security Institute (IESS), the Police and Armed Forces Health Service, the Guayaquil Welfare Board, the National Child and Family Institute, and the Ministry of Social Welfare, as well as other institutions. Altogether, this subsector covers 67% of the national population, especially in terms of hospital care. The Ministry of Public Health serves 50% of the Ecuadorian population, the Social Security Institute 10%, the Guayaquil Welfare Board 7%, and various private entities 3%; the remaining 30% of the population receives no formal medical care at all.

The 1980s saw an explosive growth of nongovernmental organizations (NGOs) working in the health field: in 1992 there were 160 such organizations, 48 (32.9%) of which had been created in 1989. The activities of these institutions are aimed basically at community development, the promotion of women's status, health care, research, and training—areas in which they have acquired important experience that could aid the development of the national health system.

In general, the work of the nongovernmental organizations is carried out autonomously; only 15% of it is tied in with the work of the Ministry. Efforts are being made to coordinate the activities of the NGOs with a view to strengthening the health sector.

Available Resources

Physical Resources

In 1991 there were 2,695 health establishments, of which 51.7% came under the Ministry of Public Health, 34.1% under the IESE and the Rural Workers Social Security Institute, and 14.2% under other institutions of the sector.

Establishments that offer in-hospital care, which include general and specialized hospitals, canton hospitals, and private clinics, represent 13.3% of all operational health units in the country. The remaining 86.7% of the units are subcenters, health posts, and physician stations.

Of the establishments that provide in-hospital care, 73.7% are in urban areas, whereas the distribution of the other types of facilities is 52.9% urban and 47.1% rural.

In 1991 there were 17,324 available beds. The largest number were provided by the Ministry of Public Health, with 7,637 (44.0%), followed by the Guayaquil Welfare Board, with 2,881 (16.6%) and the Social Security Institute, with 1,699 (9.8%). The remaining 29.6% belonged to the Police and Armed Forces Health Services, the Cancer Society, and the private sector.

The National Oral Health Program was established in 1989 with the objective of improving the oral health status of those groups at greatest risk, namely preschool and school-aged children and pregnant women.

A number of public information campaigns have been conducted by the Ministry of Public Health, local governments, and various international organizations on such themes as maternal and child care, prevention of communicable diseases, disaster mitigation and preservation of the environment. Although these messages have had an impact, they represent isolated efforts and are not part of a national health education project.

The Ministry of Public Health, the Ecuadorian Social Security Institute, the Ministry of Social Welfare, and the armed forces provide rehabilitation services for the disabled. Forty percent of the health units that offer these services to adults are located in Pichincha and Guayas, the two most populous provinces. For children there are six centers administered by the National Child and Family Institute, as well as 11 special education centers located in eight provinces.

The Ministry of Social Welfare, through its National Bureau for Rehabilitation of the Handicapped, is the institution that sets policy in this area. It is responsible for addressing current limitations in the availability of services, the lack of infrastructure, the shortage of financial and human resources, and difficulties in obtaining prostheses and other devices manufactured nationally.

Human Resources

In 1991 there were 11.3 physicians, 3.6 nurses, and 1.5 dentists per 10,000 population. Sixty percent of all

health personnel were working in the provinces of Guayas and Pichincha, and 90% were concentrated in the country's urban areas.

As of 1990 there were 15,737 physicians, 4,847 dentists, 5,045 nurses, and 11,384 nursing auxiliaries. The provinces of Pichincha and Guayas had 67.4% of the physicians, 68.1% of the dentists, 68.2% of the nurses, and 70.1% of the midwives.

The number of graduates from health professional schools declined each year during the 1980–1990 period. There were also high rates of attrition (in medicine, 17.5%; dentistry, 20.0%; nursing, 18.4%; and midwifery, 27.6%) and low proportions of students completing their studies (in medicine, 23.7%, dentistry, 26.8%; nursing, 19.3%; and midwifery, 15.7%).

The quality of the educational process has been impaired both by continued dominance of the curative care model and by budgetary limitations. As a result, human resources are trained with a focus on the provision of in-hospital care. The discrepancy between the supply and the demand for human resources in the country is illustrated by the fact that in the 1980s only 245 of over 1,000 candidates for the medical degree graduated, and only 75 of these were able to find a permanent job in either the public or the private sector.

Production of Services

In 1991 there were 49.7 hospital discharges and 1.6 beds per 1,000 population—the same levels that had prevailed since 1988. The bed occupancy rate that year was 53.0%, a decline with respect to the year before, when the figure was 57.4%. The average stay declined from 7.0 days in 1990 to 6.2 in 1991, and the rate of hospital deaths was 0.9 per 1,000 population, unchanged since 1987.

Outpatient consultations provided by Ministry of Public Health services declined from 7,812,575 in 1990 to 7,382,575 in 1991, while emergency visits increased from 888,568 in 1990 to 901,913 in 1991. A total of 77,278 surgical interventions were performed in 1990 and 68,254 in 1991.

There were 67,882 deliveries in health institutions in 1991. It is estimated that during 1983–1989 the proportion of deliveries attended by health personnel was 56%; the figure estimated for 1992 by the Ministry of Public Health was 58.3%.

Vaccination coverage increased during 1992 (Table 1). Immunization of pregnant women against tetanus

TABLE 1
Vaccination coverage (%) in infants under 1 year,
Ecuador, 1988–1992.

| Year | BCG | DPT3 | OPV3 | Measles |
|------|-----|------|------|---------|
| 1988 | 86 | 54 | 57 | 52 |
| 1989 | 91 | 55 | 64 | 57 |
| 1990 | 88 | 68 | 67 | 61 |
| 1991 | 83 | 59 | 62 | 54 |
| 1992 | 100 | 84 | 84 | 68 |

rose from 16.6% in 1990 to 18.8% in 1991 and 19.1% in 1992.

Operations under the National Tuberculosis Control Program have become considerably more efficient since 1989: the proportion of completed courses of treatment reached 80.7% in 1992, compared with only 40.5% in 1989, while patients abandoning treatment decreased from 29.7% in 1989 to 15.5% in 1992, and only 3% of cases were lost to follow-up in the latter year.

With regard to the environment, the major problems can be traced to irresponsible land use, desertification, diminished rainfall, unreasonable and unplanned exploitation of renewable and nonrenewable natural resources, industrial development in urban areas, and increasing levels of chemical pollution. The work of several public institutions is concerned with the environment and its relationship to health. The Ministry of Public Works and the Ecuadorian Institute of Sanitation Works (IEOS) are in charge of developing the sanitation infrastructure. The latter agency is responsible for the construction of physical plants as well as the control and prevention of air, water, and soil pollution. IEOS, which has focused on developing basic sanitation infrastructure, has major obstacles to overcome in attempting to reduce current deficiencies in the coverage of drinking water supply and sewerage systems.

Financial Resources

The national expenditure on health encompasses the budgets of official and semiautonomous institutions as well as those of autonomous institutions that carry out health activities but whose exact levels of spending are unknown.

The budget allocated for the social sectors as a proportion of GDP was 5.05% during 1980–1990. It showed a slight downward trend during the decade,

declining from 5.8% in 1980 to 4.7% in 1990. In 1990 public expenditure on health represented only 1.30% of GDP, but by 1991 the proportion had risen to 4.5% of GDP.

The budget of the Ministry of Health for the 1993 fiscal year was the equivalent of US\$ 91,939,962, which

represented 4% of the State's total budget. This figure reflected a 47.4% drop relative to the level of 7.6% the year before—the largest decline in the nation's history. Ninety percent of the 1992 budget went for salaries and limited operating costs and only 10% was used for investment projects.

EL SALVADOR

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

The country lived through some major political, economic, and social events during the 1989–1992 period. The peace accords signed between the Government and the Farabundo Martí Front for National Liberation (FMLN) on 16 January 1992 marked the end of the armed conflict, set the stage for the country's democratization, guaranteed respect for human rights, and began to reunite Salvadorian society. As the country embarked on this postwar period, with the many political, military, electoral, and judicial changes that it entailed, efforts focused on a national reconstruction process based on social consensus. The National Reconstruction Plan that was implemented in 1992 established the socioeconomic basis for national reconciliation and for the reintegration of those Salvadorians who had been affected by the armed conflict into the nation's life.

The Economic and Social Development Plan for 1989–1994 provided an administrative framework, as it sought to reduce macroeconomic imbalances and to increase the economy's efficiency through an adjustment program, liberalization of trade and financing, and privatization. In the social area, the Plan's goal is to eradicate extreme poverty and reduce the negative impact of adjustment policies on the poorest segments of the population.

The economy, already badly hurt by the floods of 1990 and the drought of 1991, also faced falling prices on the coffee market, increased interest on the nation's accumulated debt, and commitments assumed in the peace accords. The gross domestic product (GDP) increased 1.7% in 1989 and 4.6% in 1992, and the industrial and agricultural sectors were reactivated and contributed 1.1% and 1.6%, respectively, to the 1992 GDP growth. During 1989–1992 per capita GDP rose from -0.4% to 2.4%, and the inflation rate dropped from 20.8% to 11.2%. These economic gains were possible largely because of the inflow of foreign exchange from Salvadorians living abroad, who contributed

US\$ 2,449.8 million to the economy during that time. In that same period, the country's exports amounted to US\$ 2,252.3 million. In 1991, exports represented 26.5% of the external debt. As a contribution to national reconstruction, the United States of America forgave US\$ 464 million, bringing down the country's external debt to US\$ 1,811.8 million in 1992. Nevertheless, despite a firm fiscal policy, tax reforms, and the levy of a value added tax (VAT), internal revenue remained at only 8.5% of GDP during 1991–1992, and the fiscal deficit went from -2.5% in 1991 to -3.5% in 1992.

In 1992 the economically active population (EAP) numbered 1,871,864, or 37% of the total population. Of the total EAP, 35.6% was engaged in agriculture. The global contribution by women in the work force to the EAP increased from 37.2% in 1988 to 43.6% in 1991.

Multipurpose household surveys showed that in 1992 extreme urban poverty decreased 0.3% relative to the year before, but at the same time, urban households in a state of extreme poverty increased from 23.3% to 30.7%, and the proportion of nonpoor urban households decreased 7.8%. The increased proportion of urban households living in extreme poverty by health regions was as follows: 11.9% in the central region, 10.3% in the western region, 10.1% in the eastern region, 5.4% in the metropolitan region, and 4.9% in the paracentral region. The breakdown of urban poverty shows that it is particularly concentrated in the following cities: Ahuachapán, Usulután, Cabañas, La Paz, La Unión, and Chalatenango. For every five households living in extreme poverty, only one has electricity, only two have piped water in the home, and only one has an indoor toilet.

In 1991–1992, 66.1% of the rural households were living in poverty, and of these, 33.6% were in a state of extreme poverty. Of the 240,000 farmers producing basic grains, 36% were in extreme poverty and 41% were in relative poverty.

Food production meets 85% of domestic demand, and in the case of basic grains, 73%. It is assumed that the availability of food for human consumption is deficient in terms of key components of the basic diet such as corn, rice, beans, milk and other dairy prod-

ucts, eggs, and vegetables—foods which together should represent half the required daily energy intake.

According to the consumer price index, the cost of living in December 1992 was up 20.0% relative to December 1991, having risen 19.3% between January and December 1992. The greatest increase (23.4%) was for food. Average real income rose from US\$ 145 in 1990–1991 to US\$ 163 in 1991–1992, representing an increase of 12.4%. Money sent home by Salvadorians living abroad has played a crucial role: in more than 85% of the cases this money goes for consumption in households living in extreme poverty. In 1992, 18.4% of the urban heads of such households were unemployed—an increase of 9.5% relative to 1989, compared with a rise of only 0.2% in nonpoor households. For every 10 persons employed in urban areas, 5 work in the formal sector, 4 work in the informal sector, and 1 works in domestic service. In 1990, there were 485,041 persons working in the informal sector, of which 49% were women, and of the latter, 56.3% were engaged in some form of commerce. According to a 1990 report on itinerant food vendors, 70% of the street vendors in San Salvador were women who earned at least US\$ 2.00 per day.

A woman heads the family in 36% of the households considered to be in absolute poverty and in 31% of those considered to be in relative poverty. In 1990, most of the women who were gainfully employed were in some form of commerce, where they represented 43.1% of the work force in the formal sector and 69.8% in the informal sector. According to the Ministry of Agriculture, in 1990, 500,000 women were engaged in fishing. The proportion of women landowners is 14%, but their participation in the harvesting of crops for export and domestic consumption is 40%. The time that women devote to cooperative labor in the coffee harvest is the same as that of men, whereas in livestock raising this time amounts to an average of 10 months per year for women and only 5.9 months for men. Even so, women agricultural workers earn only 88% as much as men.

In 1991–1992 the illiteracy rate in the population 10 to 65 years old was 23%, and for every illiterate person in the metropolitan area there were five in the rural areas. Of the heads of households in extreme poverty, 92% had not gone beyond sixth grade, and of these, 52% had had no schooling at all. Basic education coverage in the population aged 7 to 15 is 67%. Out of every 100 children who enroll in first grade, 32 manage to reach sixth grade in the cities, but only 6 do so in the rural areas.

Population

According to the latest census, conducted in September 1992, the national population stood at 5,047,925, representing an increase of 40.2% in the last 20 years. Of this number, 29.3% lived in San Salvador Department, and of these, 70% were concentrated in the *municipios* of San Salvador, Soyapango, Mejicanos, Ciudad Delgado, and Apopa, which together represent 20% of the country's total population.

The population density is 240 inhabitants per km². The most densely populated department is San Salvador, with 1,667 inhabitants per km², while the least densely populated department is Chalatenango, with 90 inhabitants per km². It is estimated that the rural population represents 54% of the total. According to projections for 1992 in the last census, 44% of the people in the country were under 15 years of age, 44.6% were between the ages of 15 and 50, and 11.4% were older than 50.

The crude birth rate has steadily gone down: it was 43.9 per 1,000 population in 1970, 38.0 in 1980, and was projected at 36.0 in 1990. By the year 2000 it is expected to be 32.4 per 1,000.

According to information obtained in a retrospective fertility study conducted by the Ministry of Planning's Population Bureau in December 1991, general fertility saw a gradual decline between 1961, when it was 6.7 children per woman, and 1980, when the figure was 5.6. The pace of decline then picked up, and by 1985 the figure was 4.4—a drop of 27% relative to 1980. In regard to age-specific fertility, throughout the 1960–1985 period, the levels in women aged 15 to 19 remained consistently high, whereas a significant drop was seen in the age group 25 to 39 years old. In terms of urban-rural breakdown, general fertility in the former was 3.3, versus 5.1 in the latter, for a difference of nearly two children.

In 1988, 47% of the women between the ages of 15 and 44 who were married or living with a partner were using contraceptives.

Mortality

Municipal administrations are responsible for keeping vital statistics, which, especially in rural areas, reflect the impact of the last 12 years of war. This situation, coupled with the fact that not all vital events are reported, led the Latin American Demographic Center (CELADE) to estimate that underregistration of deaths

in the country ranged between 24.6% and 33.6% during the 1980–1985 period.

In 1990, the cause was medically certified in 58.8% of all deaths. General mortality was 5.4 per 1,000 population in 1987 and 5.3 in 1990. Life expectancy at birth reached 62.4 years during the 1985–1990 period. For women, the figure rose progressively from 61.1 years in 1970 to 66.9 in 1990. For men, on the other hand, it dropped from 56.6 years in 1980 to 50.7 in 1985, then turned up again, and by 1990 it had reached 58.1.

Mortality per 100,000 population has been declining in the under-1, 1–4, and 5–14 age groups, but in the other age groups it has been rising sharply since 1973, especially among males in the 15-to-44 age group. As of May 1991, 75,000 people had died as a direct consequence of the armed conflict. Homicides and other violent acts, in turn, accounted for 8.3% of the defined causes registered by the Ministry of Public Health and Social Welfare in 1990.

Morbidity

The 10 leading reasons for outpatient consultations in services under the Ministry remained the same over the 1988–1991 period. In 1988, the number of cases of acute respiratory infections was 126,300, and in 1991 it rose to 208,912. In 1990, a total of 111,255 intestinal infections were reported, and this figure increased to 124,592 in 1991. In 1985–1992, parasitic diseases, diarrheas, and acute respiratory infections headed the 10 leading causes of morbidity from communicable diseases. The reporting of diarrheal diseases, which have been subject to special surveillance since 1991, increased 77%. Cholera has been a growing problem since August 1991 in both urban and rural areas, with a cumulative total of 12,574 cases on record as of 14 June 1993.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

Infant mortality has been declining, partly due to the gradual reduction in communicable diseases. According to estimates by the Ministry of Planning, the rate ranged from 118.0 per 1,000 live births in 1970–1975 to 57.4 in 1985–1990. In July 1992 the Joint Health Initiative, using the indirect Brass method, estimated infant

mortality for 1990 at 73.1 per 1,000 live births in areas affected by the armed conflict.

In 1990, infant mortality in El Salvador was examined through a study of 10,011 women in the maternity services of six hospitals. By questioning these women about the fate of their previous child, this survey calculated infant mortality at 55.5 per 1,000 live births, a figure that has been adopted officially by the Ministry of Public Health and Social Welfare. Broken down by geographical location, the rate is 44 per 1,000 for the metropolitan area and 60 per 1,000 for the rural areas. Forty percent of the registered deaths in children under 1 year old were medically certified. According to information supplied by the Ministry for 1990, neonatal mortality represents 63% of infant mortality. Deaths in children aged 1 to 4 years declined from 10.6 per 1,000 in 1980–1984 to 7.8 in 1985–1989. Of the defined causes of death in 1990, intestinal infections accounted for 20.1% and pneumonia for 9.1%.

In 1991, the Ministry reported the frequency of low birthweight at 8.6%. Of 17,781 deliveries attended at the Maternity Hospital in 1992, 10.5% were low-birthweight babies.

Proportional mortality in children under 5 years old continued to go down, from 19.7% in 1987 to 17.5% in 1990.

In 1990, consultations involving children under 5 years old were mainly for acute respiratory infections, intestinal infections, and parasitic intestinal diseases, and these causes accounted for 80% of the consultations and hospital discharges.

The main pediatric hospital in San Salvador reports that each year there are 300 cases of child abuse requiring hospital care, of which the leading causes are physical abuse (29%) and accidents due to parental negligence (28%); sexual abuse is reported in 18% of these cases.

The population of working children in urban areas is estimated at 100,000 and their average age is 11; 9% of these children have had at least one run-in with the police. They earn between US\$ 1.50 and US\$ 3.00 daily in activities that change depending on the time of day: they may sell newspapers, lottery tickets, or food; take care of automobiles; or put on demonstrations (such as “fire-eating”).

Health of Adolescents and Adults

Although information is limited, a few facts can be cited. Figures for 1991 show that in the urban population there were 138 births per 1,000 women between

the ages of 15 and 19. The "Young Mothers" program, aimed at women under 19 years of age, has reported that the average age of 51% of these young mothers is 17, and that in this group, the first sexual encounter and the first pregnancy typically took place at age 11. At the same time, 55% of all reported sexual assaults are committed against girls under 15 years old.

Another phenomenon of importance in the urban population is the emergence of youth gangs. In 1992, the Catholic University reported that in a group of 116 young persons who belonged to 25 gangs in San Salvador, 76% had come from broken homes, 59% had a monthly income of US\$ 12 to \$85, 50% lived in small dwellings of mixed construction, and 41.1% lived in shacks made of sheet metal, cardboard, or wood. Of this group, 92.2% drank alcohol, inhaled glue or paint thinner, or used marijuana; 77.5% engaged in illegal activities.

Between the ages of 21 and 55, the leading causes of mortality registered by the Ministry of Public Health and Social Welfare are external causes, especially among men. These include homicide, motor vehicle accidents, and intentionally inflicted injuries. In terms of morbidity, conditions of the female reproductive system, cardiovascular diseases, emotional disorders, and cancer head the list.

Women's Health

According to the Ministry of Public Health and Social Welfare, reported maternal mortality in 1992 was 14.7 per 10,000 live births, with 67% of maternal deaths occurring among rural women. The leading causes of death were hemorrhage (41.9%), sepsis (25.8%), and toxemia (21.0%). Most maternal deaths occurred in the age group 20–34 years old (43.7%), followed by women under 19 years old (21%).

According to the Ministry's records on female morbidity for 1991, 30,958 women were diagnosed with anemia on their first consultation, of which 55.1% were between 15 and 44 years of age, 22.5% were 5–14 years old, 10.6% were in the age group 45 years old and older, and 11.6% were under the age of 5. Some 950 cases of cancer of the uterine cervix are detected annually, and 59% of these women die within 5 years.

Health of the Elderly

It is estimated that in 1985–1989 the mortality rate in the population aged 65 and older was 55 per 1,000 in

this age group—60.5 per 1,000 in men and 50.5 per 1,000 in women. The leading cause was diseases of the circulatory system. In 1990, the main causes of mortality in this age group were cardiac arrhythmia, acute myocardial infarct, and pneumonia, with rates of 390.9, 343.3, and 246.4 per 100,000, respectively. In 1991 the leading reason for consultations was essential hypertension, which accounted for 5.8% of all consultations by persons 60 years old and older, followed by diabetes mellitus (4.0%), conditions of the urethra and urinary tract (3.8%), and diseases of the joints (3.7%). There were 1,511 elderly persons living in institutions.

Workers' Health

The Salvadorian Social Security Institute (ISSS) provides health care for 14.0% of the economically active population (9.5% are men and 4.5%, women). At the end of 1992, the ISSS had provided a total of 1,401,278 initial medical consultations, of which 343,488 were emergencies. Of the latter, 85% corresponded to ordinary risks and 8% to occupational risks, while 7% were maternity cases. During 1991 the ISSS attended 12,068 cases involving accidents in the workplace, 2% of which required hospitalization for a combined total of 2,023 days. The total number of days of temporary disability amounted to 338,038. In 1991, the ISSS calculated that 110 of every 1,000 workers in the construction industry and 62 of every 1,000 in the manufacturing industries experienced some kind of accident in the workplace. The ISSS does not cover agricultural workers.

The greatest risks are found in manufacturing, construction, and mining. The principal injuries from workplace accidents are contusions and cuts, which in the construction industry are responsible for rates of 36 and 26 per 1,000 workers a year, respectively. The Ministry recorded 3,200 cases of pesticide poisoning in 1992.

Health of Special Groups

As of 1991, there were 1.5 million displaced persons, most of them in rural areas; 500,000 persons, half of them children, had been uprooted and transferred to other parts of the country; 325,000 were being held as refugees near the borders of neighboring countries; and an estimated 650,000 had emigrated to other countries. The National Reconstruction Plan estimates that during the armed conflict, the health system suf-

ferred damages totaling US\$ 125 million. The plan identifies three segments of the population that were particularly affected. The first of these is the demobilized population, former combatants in both the Armed Forces and the FMLN. In the latter group, numbering 8,530, the main needs for specialized care are ophthalmology (29.6%), orthopedics and traumatology (13.6%), and general surgery (9.1%). The second group is the displaced population, consisting of 72,000 individuals plus the repatriated population of 30,000. The crude death rate in this group is 21 per 1,000, and proportional mortality in children under 5 years old is 28.3%. The nutritional status of children under 5 years old, based on the standards of the U.S. National Statistics Center, breaks down as follows: 28.8% are of normal weight for their age, 43.1% have Grade I malnutrition, and 28.1% are suffering from Grade II or III malnutrition. Finally, the third affected population segment is the residents of the 99 *municipios* in which the conflict was heaviest, an estimated 800,000. According to the Joint Health Initiative, 52% of this population is under 15 years of age; the size of the average family group is 6.2 persons; the average woman will have had 8.3 children by the end of her reproductive life; infant mortality is 73.1 per 1,000 live births; and illiteracy in the population over 15 years of age is 50.7%.

With regard to the disabled population, it is estimated that 20,000 people require immediate care, of which 13,000 participated directly in the armed conflict.

Diseases and Health Impairments

Vector-borne Diseases

In the last 10 years, the frequency of malaria has declined. The annual parasite index (API), which was 20.92 per 1,000 population in 1980, dropped to 1.76 by 1990 and then to 1.10 in 1991 and 0.8 in 1992. In this last year, a total of 4,539 malaria cases were reported, of which 50.7% were in the western region, where there were four cases due to *Plasmodium falciparum* and the API was 1.9. Next in importance was the eastern region, with 22.3% of the cases, two of them due to *P. falciparum*, and an API of 0.8 per 1,000 inhabitants.

The reported incidence of dengue has varied from year to year. In 1988, a total of 1,863 cases were registered (74 of dengue hemorrhagic fever, although not laboratory-confirmed); there were 518 cases in 1989; 2,381 in 1990; 1,272 in 1991; and 884 in 1992—60% of these in women and 40% in men. Most cases occurred

in the metropolitan, western, and paracentral regions, each with more than 100 cases a year. Dengue virus serotypes I, II, and IV have been detected. The rate of *Aedes aegypti* household infestation in the 14 department capitals is 45% during the dry season and 68% in the rainy season.

Regarding Chagas' disease, the prevalence of *Trypanosoma cruzi* infection is 20.5%, and the number of infected persons is estimated at 1,150,000, most of them living between 660 and 1,000 m above sea level. The rate of household infestation by triatome bugs ranges from 26.3% in urban areas to 100% in rural areas. The main domestic reservoirs are dogs, with an infection rate of 21.5%. The infection rate in blood donors ranges from 5% to 14%.

In 1992, 20 cases of nodular nonulcerated cutaneous leishmaniasis were diagnosed among former combatants living in the town of Santa Clara. In that same year, an active focus of autochthonous cases was found in San Ildefonso, San Vicente Department. The principal vector is *Leishmania longipalpis*.

Vaccine-preventable Diseases

No cases of poliomyelitis have been detected since October 1988. The causative agent of diphtheria was last isolated in 1987. The rate for whooping cough jumped from 0.75 per 100,000 population in 1988 to 4.13 per 100,000 in 1990, a rise that could possibly be attributed to improved epidemiologic surveillance following a sizable increase in vaccination coverage. With measles, the rate per 100,000 population dropped from 321.8 in 1989 to 14.6 in 1991, an expected situation after the epidemic. The rate for neonatal tetanus declined from 0.7 to 0.5 per 1,000 live births over the 1988–1992 period.

Cholera and Other Intestinal Infectious Diseases

Between August and December 1991, a total of 947 cases of cholera were registered, with a case-fatality rate of 3.6%. In 1992, a total of 8,106 cases were reported, for a case-fatality rate of 0.6%. As of 30 June 1993, 3,521 cases had been registered and the corresponding case-fatality rate was 0.2%. Males and the age group 16 to 45 years old were the most affected, and La Libertad, Usulután, La Paz, Chalatenango, and San Salvador were the departments with the most cases. The predominant serotype in 1991 was *Vibrio cholerae*, serogroup 01, biotype El Tor Inaba, while in

1992, 95% of the cases were due to the Ogawa serotype. The watercourses that were found to be contaminated in 1991 (Cara Sucia River, Coatepeque Lake, and Sepaquiapa River) appeared to be free of *V. cholerae* in 1993.

In 1992, the Ministry of Public Health and Social Welfare reported that 4 out of every 10 children under the age of 5 had had an episode of diarrhea. In 1988 there were an estimated 3,214,800 diarrheal episodes in children under 5, representing an annual average of four episodes per child. The use of oral rehydration fluids increased from 14% of the reported cases in 1988 to 43% in 1989.

Chronic Communicable Diseases

For the last 10 years, the *tuberculosis* rate has remained at around 46.3 per 100,000 population, with only slight variations. Of 29,331 patients with respiratory symptoms seen in 1992, 2,288 (7.8%) were found to have confirmed cases of pulmonary tuberculosis. A total of 2,267 patients identified that year were placed under the treatment regimen, but 9.3% of them had abandoned it by the fourth month. Twelve cases of tuberculosis in HIV-infected persons were reported during 1992.

The Ministry of Public Health and Social Welfare estimates that there are 60 cases of leprosy in the country. Between 1984 and 1992, two cases were registered in the department of Chalatenango, two in La Unión, three in San Salvador, and one in Usulután. All of them were in persons older than 15 years old, and multi-bacillary forms were predominant.

Respiratory Diseases

According to Ministry estimates, 7 out of 10 children under the age of 5 were seen for an acute respiratory infection during 1992. As of July of that year, the prevalence among children under 5 years old in the areas affected by the armed conflict was 39%. Pneumonia ranked among the 10 leading causes of death and accounted for 3.5% of all deaths registered in 1991.

Rabies

The number of cases of human rabies rose progressively from 1 in 1989 to 19 in 1992. Of these, nine were reported in the eastern region and four in the western region. At the same time, the number of cases of canine

rabies increased from 26 in 1989 to 87 in 1992, and the metropolitan, western, and central regions were most affected. The number of cases of bovine rabies went from 8 in 1989 to 23 in 1992.

AIDS and Other Sexually Transmitted Diseases

The first case of AIDS in the country was reported in 1985. From then until 28 April 1993, there were 530 reported cases of HIV infection and 479 cases of AIDS. Of the combined total of 1,009 HIV/AIDS cases, 77.7% were in men and 22.3% in women, for a male/female ratio of 3:1. The predominant form of transmission is sexual contact (60.4%); blood transfusion and perinatal routes each accounted for 1.8%. As of 1992, HIV/AIDS cases in children under 4 years old represented 1.5% of all cases registered. Among sexual workers, the prevalence of HIV infection is 2.2%, while the proportion is 0.6% among prisoners and 0.3% among blood donors.

The prevalence of syphilis has been stable since 1988, at 55.6 per 100,000 population. The same is true of genitourinary gonococcal infection, for which the rate is 118.8.

Nutritional and Metabolic Diseases and Deficiencies

The diet's main staple is basic grains in one combination or another. Corn consumption is 2.4 times greater in rural areas than in urban ones. Since corn is low in lysine and tryptophan, it should be supplemented with beans, but most households cannot acquire beans because of this foodstuff's limited supply. An assessment of the food and nutrition situation conducted in April and October 1988 showed that 50% of all families have an energy deficiency: 20% are undernourished and the other 30% have deficient diets. In 1990, it was estimated that protein-energy malnutrition, expressed as retarded physical growth (-2 standard deviations from normal height for age) affected 436,000 children under the age of 5, a figure that includes 132,700 children with moderate or severe malnutrition. The situation is more serious in rural areas, and it is especially severe in the departments of Morazán, Ahuachapán, and Chalatenango. Vitamin A and retinol deficiency affects 313,700 preschoolers; those most affected are children 12 to 17 months of age, 60% of whose serum levels of vitamin A are below 30 $\mu\text{g}/\text{dl}$. In rural areas, 61% of the preschool population as a whole is below this level. Iron deficiency is found in 570,000 of the country's children under 5 years old,

and again the prevalence is greatest in the group aged 12 to 17 months, where the rate is 51%. Between 20% and 25% of children under 5 years old show low hemoglobin levels.

The prevalence of iodine deficiency in children 6 to 14 years of age was 24.8% in 1990, and the rural population in the western and eastern regions was most affected, with rates of 40.6% and 31.6%, respectively.

Diabetes mellitus is one of the 10 leading causes of registered deaths. In 1990, it accounted for 7% of the defined causes of death in the age group 45–64 years old and 6% in the group aged 65 and older.

Cardiovascular Diseases

Cardiac arrhythmia (including cardiac arrest) and acute myocardial infarct are among the 10 leading causes of mortality. In 1990, these two conditions represented 5.5% and 3.5% of all deaths, respectively.

Malignant Neoplasms

In 1990, leukemias represented 5.8% of all defined causes of death in the age group 5–14 years old, while malignant neoplasms of the stomach accounted for 6% of all causes among those aged 45 to 64. During that same year, neoplasms of the trachea, bronchi, lungs, and other respiratory organs of the chest were responsible for 67 deaths in men and 34 in women.

Of all the reported deaths from malignant neoplasms in women in 1990, 18% were of the cervix and corpus uteri, with most cases in the group aged 45 to 54.

Accidents and Violence

Homicides, accidents, and other forms of violence ranked among the leading causes of death, and in 1990 represented 12.2% of all mortality from defined causes. In 1990 there was a total of 1,088 reported deaths from motor vehicle accidents (79% in men and 21% in women).

Behavioral Disorders

In a survey of the population aged 15 to 54 conducted in the San Salvador metropolitan area in July 1991, it was found that 42.9% of the respondents drank

alcoholic beverages on a regular basis, and that 46.3% had begun to drink between 15 and 19 years of age. With regard to the use of tobacco, 27.4% of the persons interviewed were habitual smokers; men had begun the habit between the ages of 11 and 15, and women, between ages 16 and 20. The study, which examined 3,057 questionnaires from the metropolitan area, also showed that 74.1% of the interviewees had had some experience with marijuana and 2.9% of them were habitual users; 0.4% regularly used cocaine.

In 1992, the services under the Ministry of Public Health and Social Welfare registered 28,777 cases of anxiety disorder, and the ISSS reported that such disorders represented 90% of all psychiatric problems attended. In addition, 2,236 cases of depression and 312 cases of psychosis were recorded.

Risk Factors

Risks in the Physical Environment

The country has 10 drainage basins and 360 rivers of varying size; some are seasonal, with an overall volume of less than 1 m³/s. The Lempa River basin is shared with Guatemala and Honduras, and that of the Guascorán River with Honduras. Surface and underground waters are polluted by direct domestic sewage discharge and industrial waste, as well as by improperly disposed of urban solid waste that is carried by wind and rain to the nearest watercourses. Drinking water in the metropolitan area is disinfected by means of injections of chlorine gas; elsewhere, sodium hypochlorite is added. Fifty percent of the water samples taken from the San Salvador urban network met standards for physical and chemical quality and had high levels of iron and manganese. Prior to August 1991, none of the drinking water in the rural areas was chlorinated; after that date, chlorination was entrusted to local water administration boards, but in most cases chlorination is not carried out regularly. In the areas that were hardest hit by the armed conflict, only 39.8% of the population had access to piped water and 35.4% to water from unprotected sources; 47.7% had no sanitation facilities whatsoever.

Only 13% of the country has any forest or scrub cover, and two-thirds of the land is being severely eroded. Wildlife habitats are being drastically altered, and many animal species are being indiscriminately hunted and trapped for both subsistence and trade. Moreover, pesticides are used improperly.

It is estimated that 1,911,000 kg of solid waste are generated daily in urban areas, of which only 50% is collected. Of this latter portion, 65% is treated in some way and the rest is disposed of in open landfills. The 7 government hospitals and the 18 private hospitals generate 1,512.9 kg of waste a day, of which only one-third is incinerated. Pathogenic waste is mixed in with regular waste and then is collected by the regular municipal services. Of the liquid waste, 56% is disposed of in subterranean waters and 20% in surface waters.

Natural Disasters

Floods in 1989 and 1993 affected portions of the eastern region. The country also experiences periodic droughts; the most recent, in September 1992, affected the western, central, and eastern regions.

Housing

In 1988, the Ministry of Planning estimated the housing shortage at 43.8%, in addition to which 38.6% of the existing dwellings were considered to be in poor condition. The main materials used for construction are mud and wattle (45%), adobe (32%), wood (4%), sheet metal, cardboard, and/or other discarded materials (7%), and mixed (12%). A 1990–1991 national survey of urban household income and expenditures revealed that 54% of the dwellings had one or two rooms, and that 41.2% of them were improvised and were illuminated with kerosene or gas. Of these dwellings, in urban areas 50.8% had a toilet with indoor plumbing; 43.5% had a toilet, pit, or latrine; and 5.7% had no sanitation facilities whatsoever.

Food Contamination

In a 1985 study of microbiological and biological contamination of food that looked at 775 samples taken from markets and street vendors in San Salvador, 83.8% of the samples were found to contain *Escherichia coli*. In samples collected from households in five San Salvador neighborhoods, the occurrence of fecal contamination in dairy products, fruits, vegetables, and meat came to about 50%. In investigations of itinerant food vendors conducted in 1990, fecal contamination was found in 60% of the samples taken from food stands on the streets of San Salvador.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

General Policies

In May 1991, El Salvador endorsed the second phase of the Central American Health Initiative, "Health and Peace for Development and Democracy," and committed itself to the improvement of the health situation of its people. The Trifinio project demonstrated El Salvador's will to work jointly with Guatemala and Honduras in providing health care to the population groups concentrated along their mutual boundaries; the Trifinio territory, defined in 1986, corresponds to border areas shared by El Salvador, Guatemala, and Honduras. The Trifinio Health Project was established in 1987 and has the following priorities: infant survival, food and nutrition, vector-borne diseases, drinking water and sanitation, and strengthening of the health services network.

The Government's social strategy, which responds to the current context of structural adjustment, establishes the criterion of health in development and incorporates education and housing into its efforts to focus the services and to strengthen the health care systems and expand their coverage. The peace accords signed at Chapultepec, Mexico, paved the way for a participatory peace, while implementation of the National Reconstruction Plan helped to channel available resources toward the country's reconstruction. In turn, execution of the Health Services Emergency and Maintenance Plan for Areas of Concentration made it possible to provide medical, dental, emergency, and specialized care to former combatants, thus contributing to the consolidation of peace. In July 1992, the II Central American Congress on Free Enterprise approved the Declaration of San Salvador, which recognizes, *inter alia*, that the persistence of inequality in the area is one of the main hurdles to the development of international competition and is jeopardizing the success of the new development initiatives.

Population Policies

The country's population policies recognize the rights to life and to be able to make a free and responsible decision to have children if and when they are

wanted. The policies also recognize the equality of women and call for protection of the family as the basic unit of society. The objective is to achieve better distribution of the population in the national territory in an effort to make the most efficient use of resources within a context of balanced national development.

Health Policies and Strategies

The 1991–1994 National Health Plan states that health activities should aim at extending coverage.

The Ministry of Public Health and Social Welfare encompasses five public health regions: the western, central, metropolitan, paracentral, and oriental. The country relies on the local health system as the operational means for achieving human development and democratic community participation, as well as for identifying and providing comprehensive solutions to the population's health problems, emphasizing the groups at greatest risk. The Interinstitutional Corporation has been established in San Salvador's eastern region, and the local health systems in Nueva Concepción and Chalatenango have been officially established.

The ISSS provides illness, maternity, disability, old age, and death benefits to several groups of workers. Starting in July 1993, coverage was extended to beneficiaries' children under the age of 3.

In addition to the Ministry and the ISSS, the Salvadorian Red Cross, the health services of the Ministries of Interior and of Defense and Public Safety, the Military Hospital, the private health services, and the services of nongovernmental organizations also provide care.

The means used for financing the budget of the Ministry of Public Health and Social Welfare include cost recovery, institutional fiscal autonomy, and contributions by the community in the form of funds, materials, and labor. In 1991, the population covered by the Ministry reached 4,474,000 and the public health budget was set at C 404,820,830—the same figure as for 1990, representing a per capita expenditure of C 90.5 (US\$ 11.00).

Coordinating the activities of the sector's various institutions, particularly the ISSS and the Salvadorian Red Cross, is the principal strategy for optimizing resources and raising the level of response provided by the Ministry's installed capacity. Among its lines of action, the National Reconstruction Plan envisions rebuilding the physical infrastructure of the health services damaged during the armed conflict.

The food and nutrition policies focus on promoting an adequate diet during pregnancy and lactation, food hygiene and preservation, the production of traditional foods for home consumption, and the control of specific nutritional deficiencies. Activities undertaken include education, the promotion of appropriate eating habits, and supplementary mother and child feeding in rural and marginal urban areas. In 1991, supplementary feeding was provided for 44,773 individuals. During 1991–1992, three community campaigns were mounted to distribute vitamin and mineral supplements to mothers and children.

There is a basic rural sanitation program, and its overall objective is to improve the rural environment by building drinking water systems and latrines and improving rural housing and education.

There is no national policy on drugs and immunobiologicals, nor is there an approved list of basic drugs; various institutions each have their own lists. In 1992 there were 15,000 registered pharmaceutical products.

The national development policy has three main objectives: (1) to offset the negative effects of adjustment policies on the income of those living in extreme poverty; (2) to provide nutritional care for vulnerable groups, especially pregnant women and children; and (3) to create a basic social infrastructure, in order to improve the quality of life of the neediest communities. The target populations were identified on the basis of criteria derived from the First National Census of Height and Weight in Schoolchildren, and 78 *municipios* considered to be in extreme poverty were selected. The Community Outreach Education Program that began to function in 1991 had extended coverage to 51,900 children by the following year. In *municipios* where poverty is most severe the Comprehensive Child Health Project also was implemented, as a way to improve conditions so that children can complete more schooling. To combat vitamin A deficiency, 70% of the sugar produced in 1990–1991 was fortified with this nutrient. National vaccination days were held in addition to the regular vaccination programs in rural areas.

The Ministry of Public Health and Social Welfare carries out a community health program that promotes human development, and within its framework, health education provides the technical underpinnings that enable the population to take charge of its own health. The difficulties that have been encountered include lack of intrasectoral and intersectoral coordination; the limited development of operational research on the subject; and the mass media's lack of commitment.

The legislative branch was studying a proposed reform to the penal code regarding environmental viola-

tions. The Legislative Assembly approved a law on the iodination of salt. In 1992 the Industrial Foundation for the Prevention of Occupational Risks carried out a survey of laws relating to protection of the health of workers.

Organization of Services

Personal Health Care Services

Of all the people in the country who report some type of illness, 12% seek medical care, and of these, 42% receive it from the Ministry of Public Health and Social Welfare, 12% from the ISSS, and the remaining 46% from private services, one-fifth of which correspond to nongovernmental organizations.

In 1992, the first level of health care under the Ministry was being provided by 110 health units and 201 health posts that carried out promotion and prevention activities and provided medical consultation. The second level corresponded to 15 health centers and 14 hospitals, and the third consisted of the Rosales, Bloom, Maternity, Psychiatric, and Neurological Hospitals in San Salvador.

Rehabilitation services come under the Salvadorian Institute for Rehabilitation of the Disabled and are decentralized. The ISSS provides its 536,001 beneficiaries with first- and second-level services located in four regions of the country. At the third level, the services have acquired up-to-date cardiology technology and a specialized hospital has been inaugurated. Military personnel and their families have two hospitals they can use, one in San Salvador and the other in San Miguel.

In 1992, the country had 8,585 hospital beds, of which 64% corresponded to the Ministry, 17% to the ISSS, and 19% to private and independent establishments. The ratio of beds per 10,000 population was 17.0, ranging from 30.0 per 10,000 in the Department of San Salvador to 4.1 per 10,000 in the Department of Morazán. Excluding emergency and observation beds, in 1991 the Ministry had 1,098 pediatric beds (21% of the total), and 12% of its beds were for maternity cases.

Prenatal coverage recorded by the Ministry declined from 34.5% in 1987, to 27.9% in 1990, and 25.9% in 1991. Institutional deliveries dropped from 35.7% in 1987 to 25.9% in 1991.

In 1992, immunization coverage of children under 1 year old was 61% for the three doses of OPV and DPT,

and 55% for measles vaccine. Coverage was 80% or higher in 84 of the 262 *municipios* for the three doses of OPV and DPT and in 78 of them for measles vaccine.

In 1992, only 8% of the population had access to dental services; only in 34% of cities with a population of more than 10,000 do the health establishments provide dental consultations.

According to the National Health Plan, the population's coverage theoretically breaks down as follows—80.0% under the responsibility of the Ministry, 12.5% under the ISSS, and 7.5% under the private subsector; the demand for outpatient care theoretically should be filled as follows—45.2% by the private subsector, 39.8% by the Ministry, 12.4% by the ISSS, and 2.3% by other providers. The Ministry meets 75.5% of the demand for hospitalization, while 12.6% of it is handled by the ISSS, 9.4% by the private subsector, and 2.5% by other providers.

Health care resources are heavily concentrated in urban areas, especially in San Salvador. Except for X-ray and electroencephalography equipment, high technology is found only in private hospitals. In 1992, the ISSS installed units for kidney transplants and cardiovascular surgery.

Environmental Services

The National Aqueduct and Sewerage Administration supplies drinking water to 176 *municipios* with 1,980,408 inhabitants, or 39% of the population. The National Plan for Basic Rural Sanitation and the municipalities provide water to 78 rural *municipios*, and there are 8 *municipios* without this service. Water is available to 86.3% of the urban population (77% from underground sources) and 17.5% of the rural population (80% from surface sources). Regarding excreta disposal, 81 *municipios* have sewage system connections, and 181 do not have this service; 82.4% of the urban population has excreta disposal services and 58.2% of the rural population has latrines and septic tanks.

In 1992, 12 rural aqueducts were completed, which benefit a total population of 17,813; another 50 systems serving 158,212 persons were being built. A total of 10,605 latrines have been installed to serve 63,630 inhabitants.

Health Promotion

In 1991–1992, the Ministry of Public Health and Social Welfare broadcast 132,000 radio and television

messages to 175 *municipios* on the subjects of comprehensive health, cholera, immunization, and AIDS. The El Salvador Antidrug Foundation, the Salvadorian Red Cross, and the Office of the Attorney General carried out programs aimed at preventing drug addiction and delinquency. The National Secretariat for the Family promotes the health of women and the elderly, and the ISSS has redoubled its promotion and prevention efforts in the areas of mental health, reproductive health, and health of the elderly. The Executive Secretariat for the Environment is responsible for environmental protection.

Social and Community Participation

Volunteers work in the communities on malaria and dengue control, and midwives also provide services at the community level. Universities require community work as a basic part of their programs. Traditional medicine also is practiced; it offers alternative treatments, herbal preparations, and other remedies. In 1992, the country's health promoters worked in 579 communities that had a combined population of 800,000.

Available Resources

Human Resources

Institutions working in human resources development include the University of El Salvador, four private universities, and the Ministry of Public Health and Social Welfare, but these efforts are uncoordinated and lack a shared sense of direction. The National School of Nursing closed, leaving responsibility for the training of nurses in the hands of private institutions. Since 1988, each year the Ministry has given distance education courses in management and administration for medical personnel.

In 1992, the Ministry of Public Health and Social Welfare had 2,502 physicians, or 5 per 10,000 population. The total number of dentists came to 190, or 3 per 100,000; 56% were located in the metropolitan region. Only the metropolitan region had pharmacists. Sixty-seven percent of the sanitary engineers were assigned to the central level of the Ministry, while the regions had only one each, except for the metropolitan region, which had three. Nurses and nursing auxiliaries numbered 3,415, or 6 per 10,000 population, and their regional distribution was the same as that of physicians.

By 1992, the Ministry had trained 579 health promoters, who carried out 160,000 actions aimed at providing preventive care. The 3,400 midwives who had been trained as of then attended 32,000 home births, an increase of 17.6% over the year before.

There are 51 scientific and technical documentation units, of which 32 focus on the health sciences; 39 of the total and 17 of those that provide information on the health sciences are located in San Salvador.

Financial Resources

In 1992, the budget of the Ministry of Public Health and Social Welfare came to the equivalent of US\$ 104,366,140. Of this amount, 73.5% is funded by the Government, 23% by loans and donations, and 3.5% by charges for its services. The moneys are allocated in the following manner: 27% for hospitals, the High Council of Public Health, the Salvadorian Institute for Rehabilitation of the Disabled, the Home for the Elderly, and the Salvadorian Red Cross; 24% for operational health services; 5% for administrative costs; 4% for investments; and the remaining 40% for eight other expenditure categories. Public spending on health represented 8.3% of the 1992 national budget and 0.9% of the 1991 GDP.

The ISSS is financed by contributions from workers (2.5% of their wages) and their employers (6.25%), and by at least C 5 million from the State.

Technical and financial cooperation projects in the area of health for the 1992–1995 period have been grouped into three areas: health system infrastructure, health promotion and care, and disease prevention and control.

Physical Resources, Equipment, and Supplies

In 1991 the Ministry had 5,266 beds (not including beds for emergencies and observation), of which 17.5% were for medicine, 16.6% for surgery, 20% for pediatrics, and 11% for maternity. The average stay was 6 days for medicine, 9 for surgery, 5 for pediatrics, and 2 for maternity; the bed occupancy rate was 54.9% for medicine, 63.9% for surgery, 50.7% for pediatrics, and 67.3% for maternity; and the bed turnover rate was 29 for medicine, 27 for surgery, 35 for pediatrics, and 109 for maternity.

The Ministry has a central laboratory as well as clinical laboratories in all the hospitals and in some of the health centers and units. Of the 100 installed laborato-

ries, 85 are in operation. The ISSS has laboratories in its hospitals and medical units in the metropolitan area, whereas in the rest of the country it contracts for these services. The Military Hospital, the National Telecommunications Administration Hospital (ANTEL), and the private hospitals have clinical laboratories. The Salvadorian Red Cross, which has the most complete blood bank, provides 42% of its services to the hospitals of the Ministry, 22% to the ISSS, and the rest to the Mil-

itary and ANTEL Hospitals and private establishments. In 1992 the Ministry's expenditures on drugs amounted to C 79,892,210, of which 32% came from the national budget and the remainder from the United States Government—51% through USAID and 17% through Public Law 480 ("Food for Peace"), whereby countries can repay food debts in their own currency, and these funds are then spent in the country. This sum made it possible to meet 37.1% of the country's needs in 1992.

FRENCH GUIANA, GUADELOUPE, AND MARTINIQUE

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

French Guiana, Guadeloupe, and Martinique are French regions as well as departments. Despite efforts towards greater self-reliance, to a large extent they continue to depend on imports from mainland France. Differences among them notwithstanding, the three share many health problems; unemployment and the marginal population settlements on the outskirts of urban centers and in remote rural areas remain two of the main social problems. In addition to serving their own populations, Guadeloupe administers the health services on the island of Saint Martin, and French Guiana those on the island of Saint Laurent du Maroni.

Life expectancy at birth in the French Antilles and Guiana approaches that of mainland France. Life expectancy for men in Martinique is 73.3 years (compared to 72.4 years in mainland France) and 80 years for women (compared to 80.6 years). For men, life expectancy in Martinique has topped that of mainland France for a decade. There also are differences between the departments: life expectancy for men in Guadeloupe is 70.8 years, as compared to 67.5 years in French Guiana; for females, the figures are 78 years and 74.6 years, respectively.

Population

Between 1982 and 1990, the populations of Guadeloupe, Martinique, and French Guiana increased by 17%, to 387,000, 360,000, and 115,000, respectively. French Guiana has the lowest population density of the three, and its population is concentrated in the capital (Cayenne) and along the coastal plains. As in many of the neighboring English-speaking countries, the percentage of the population under 15 years old is more than 30% in Guadeloupe and French Guiana.

Martinique's trend towards an "older" population distribution is reflected in the fact that more than 12% of the population is older than 60 years, and the percentage under 15 years is closer to 25%.

Mortality and Morbidity

In 1992, the birth rate in French Guiana was 31 per 1,000 population, while that of Martinique was 19 per 1,000 population. However, mortality rates are quite similar, estimated in 1992 at 6.6 per 1,000 in Guadeloupe, 6.2 per 1,000 in Martinique, and 5.7 per 1,000 in French Guiana.

There is little or no information on or inquiries into morbidity, and, as a result, assessment of infant mortality, birth-related deaths, causes of death, and years of potential life have to be used as proxies for measuring health.

Infant mortality had declined to 12.9 per 1,000 live births in Guadeloupe, 8.6 per 1,000 in Martinique, and 24.6 per 1,000 in French Guiana by 1991. However, perinatal mortality remained a major problem. In the population 0–14 years old, accidents and AIDS are of major concern.

At first glance, causes of mortality appear similar to those of mainland France—diseases of the circulatory system are the main cause of death, followed by tumors and accidents—but a more detailed look shows very great differences. Moreover, when the result is analyzed in terms of years of potential life lost, the order changes to accidents, malignant neoplasms, and diseases of the circulatory system.

AIDS has become the main cause of death from infectious diseases, along with tuberculosis, dengue, and intestinal infections. Dengue is endemic in French Guiana, where chloroquine-resistant malaria is on the rise. The incidence of AIDS reported in 1990 reached 68.8 per 100,000 population, with the age group 30–39 years old being the hardest hit, and the primary mode of transmission being heterosexual.

Cancer of the stomach is the most frequently occurring malignant neoplasm in the French Antilles and Guiana, especially among men; the second most frequently seen site for men is the prostate. Among women, cancer of the cervix is more widespread in the French Antilles and Guiana than is breast cancer.

Diabetes is a major cause of morbidity. In the French Antilles and Guiana, chronic kidney failure is a common occurrence with both diabetes and high blood pressure.

The mortality rate from diseases due to alcoholism (including cirrhosis) is greater in Guadeloupe than in Martinique.

The major cause of violent death is homicide.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Organization of Services

The health systems of all three departments are modeled after that of France, with some variations reflecting their particular characteristics.

A 1982 law decentralizing operational and administrative responsibilities to regions and departments establishes the following jurisdictions within the health sector: the State (central government level) is responsible for social security funds, public hospitals, and the supervision of other institutions or services, including environmental health, vector control, mental health, alcohol and drug abuse, epidemics, and student health; the department level is responsible for maternal and child care, vaccination, cancer, sexually-transmitted diseases, tuberculosis, and leprosy; and the regional level is responsible for materials, equipment, and research.

Most health activities, such as those pertaining to mental health, maternal and child care, and student health, are organized on a sectoral basis to allow for full coverage. However, to date the different sectors do not achieve coverage of the same geographic areas.

Primary health care services are provided by private general practitioners throughout Guadeloupe and Martinique and in the coastal communes of French Guiana. Infirmaries and home-care services for the elderly also are being developed. Public health clinics, which are found in all three departments, are primarily responsible for the delivery of basic preventive care and constitute the final element in the primary care system.

TABLE 1
Hospital beds by type, Guadeloupe, Martinique, and French Guiana, 1991.

| Type of bed | Public | Private |
|----------------------------------|--------|---------|
| Total | 5,500 | 1,728 |
| Short-stay | 3,928 | 1,428 |
| General and specialized medicine | 2,512 | 467 |
| Surgical | 1,025 | 670 |
| Maternity | 391 | 291 |
| Medium-stay | 380 | 248 |
| Long duration | 40 | 52 |
| Mental illness | 1,152 | — |

Health centers, which constitute the basis of primary health care, provide the following services: maternal and child health, tuberculosis control, control of sexually transmitted diseases, immunization, mental health, health education, and consultations with general practitioners in the health centers in French Guiana.

French Guiana's public health clinics provide both preventive and curative care to rural populations; larger clinics are equipped with a small hospital unit and a basic laboratory. French Guiana has been divided into eight sectors, each covered by a physician assisted by a paramedical team.

Hospital services are provided by public hospitals and private clinics; hospitals and specialists in private practice provide specialized outpatient care. Highly specialized care services, such as neurosurgery, burn treatment, oncology, nuclear medicine, and scans, are provided primarily by the regional hospital centers located in Fort-de-France (Martinique) and Pointe-a-Pitre (Guadeloupe). Some patients requiring special care may be transferred to larger centers in France or elsewhere. Table 1 shows the number of hospital beds available by type of bed.

A medical emergency facility was established in Martinique in 1983, and mobile emergency units were set up in French Guiana and Guadeloupe in 1984 and 1987, respectively; the departments' fire and rescue squads are part of these systems. A large network of private ambulance services provides nonemergency transportation.

Guadeloupe and Martinique each have a blood transfusion center, and there is a blood transfusion unit at the hospital center in Cayenne. Hospital laboratories and many private laboratories perform laboratory tests. There are Pasteur Institutes in French Guiana and Guadeloupe.

TABLE 2
Human resources in health by type, Guadeloupe, Martinique, and French Guiana, 1991.

| Type of personnel | Number |
|-----------------------|-------------------------|
| General practitioners | 749 (533 independent) |
| Specialists | 623 (336 independent) |
| Total doctors | 1,372 (869 independent) |
| Surgeons-dentists | 283 |
| Pharmacists | 281 |
| Midwives | 260 |
| Nurses | 2,720 |
| Psychiatric nurses | 680 |
| Physiotherapists | 206 |
| Speech therapists | 72 |
| Opticians | 57 |
| Chiropractors | 23 |

Drugs are supplied by private pharmacies (at least one per commune) and by health clinics in French Guiana's jungle areas.

Preventive services include environmental health (water supply and sanitation control, food and occupational safety, home hygiene); social hygiene (tuberculosis, leprosy, sexually transmitted diseases, vaccination); supervision of mental health and alcoholism and drug abuse prevention services; parasitology; *Aedes aegypti* control; and AIDS prevention. Family health preventive services also are covered by the maternal and child care services (pre- and postnatal monitoring) and by the school health services (student health monitoring). Private organizations actively participate in the organization of preventive efforts, including those that deal with health education, alcoholism, family planning, and AIDS.

Medical and/or social facilities screen and care for handicapped children and adults. Although these facilities have recently developed significantly, handicapped children and adults are still transferred to France.

Regional health observation posts created in the three departments gather and disseminate health-related data to help maintain the epidemiologic surveillance of the population and to participate in the decision-making process.

The number of public and private hospital beds ranges from 8.9 per 1,000 population in French Guiana, to 10.5 in Martinique, and 11.2 in Guadeloupe. Seventy-five percent of available beds are used for medical, surgical, gynecological, and obstetrical services;

TABLE 3
Number of practitioners per 1,000 population, Guadeloupe, Martinique, and French Guiana, 1990.

| Practitioner | Guadeloupe | Martinique | French Guiana |
|-------------------|------------|------------|---------------|
| Doctors | 1.4 | 1.7 | 1.3 |
| Pharmacists | 0.6 | 0.4 | 0.2 |
| Surgeons-dentists | 0.3 | 0.3 | 0.4 |

15% are occupied by psychiatric patients; and 10%, by convalescence or rehabilitation patients.

The modern regional hospital centers in Fort-de-France and Pointe-a-Pitre were built and became operational during 1982-1987. Public hospitals in French Guiana and Guadeloupe are being upgraded.

Equipment, such as hemodialysis units, particle accelerators, gamma scintillation cameras, ophthalmic lasers, and scanners, gradually has been acquired, which has cut back on the number of patients who need to be transferred to France.

Available Resources

Financial Resources

The social security system covers 80% of medical care expenses, which constitute the bulk of health sector expenditures. The State and the departments/regions share the cost of preventive actions; the latter also cover the cost of free medical care given to residents not covered by social security.

Efforts to control health expenditures began in 1979. Given French Guiana's 4% per year population growth rate, this department's health needs will be particularly difficult to meet without added resources.

In the past, growing health sector budgets allowed for accelerated efforts to make up for lost ground and for the creation of units to deal with emerging problems. This is no longer the case. Health and demographic criteria, as well as differences in medical and paramedical staffing, must be considered when the departments' health sector budgets are reallocated or increased.

Human Resources

The three departments show similar ratios for certain types of human resources in health per 10,000

population; these ratios have increased rapidly over the past 20 years. Tables 2 and 3 show the number of health personnel by type, and the ratio of selected types of health human resources per 1,000 population.

In 1990, there were about 15 physicians per 10,000 population (60% of them general practitioners and 40% specialists), twice the number in 1972. Most

physicians, particularly specialists, are concentrated in each department's capital. Given the number of medical students still in training, the number of physicians is expected to climb even higher for several years. There were around four dentists per 10,000 population in 1990 and their number also doubled from 1972 to 1990.

GRENADA

GENERAL HEALTH SITUATION AND TRENDS

Grenada is a constitutional monarchy within the Commonwealth of Nations. The Governor General is the representative of the Government of the United Kingdom. Parliamentary democracy was restored in 1985. Grenada is a founding member of the Caribbean Community and the Organization of Eastern Caribbean States.

The country encompasses the islands of Grenada, Carriacou, and Petit Martinique, which lie at the southern tip of the Windward Islands in the eastern Caribbean. The enumerated population at the 1991 census was 94,806. Grenada, the largest of the three islands, has an area of 310 km² and a population of approximately 89,000. Carriacou, the second largest, extends for 34 km² and is situated 65 km north of Grenada; its population is about 5,000. Petit Martinique islet lies 4 km off the coast of Carriacou, has a population of 700, and extends for about 2 km².

The GDP grew at a rate higher than 5% per year for the 5-year period between 1986 and 1990, inclusive. Growth slowed in 1991, when the economy expanded by only 3%, due mainly to a contraction in the agricultural output sparked by weak export prices. In 1992, the country experienced negative growth.

Agriculture remains the mainstay of the economy, although its contribution to the GDP has decreased somewhat: in 1988, agricultural production contributed 20.6% of the GDP, but this contribution fell to 15.5% in 1991. Much of the agricultural production is geared for export, with the principal exports being bananas, cocoa, nutmeg, mace, and fresh fruit. Clothing is the main nonagricultural product for export.

On the other hand, tourism has become increasingly important over the 4-year period between 1988 and 1991. Hotels and restaurants contributed 6.1% of GDP in 1988 and 7.5% in 1991. There was, however, a downturn in 1992, when the number of European visitors declined because of recessions in the United Kingdom and Germany. The completion of a modern international airport has greatly facilitated the tourist trade.

Health and Living Conditions

Per capita GDP at market prices was estimated to be EC\$ 6,000 in 1990 (US\$ 1.00 = EC\$ 2.70).

Grenada has experienced ongoing fiscal problems during the 4-year period from 1988 to 1991, despite that period's economic growth. The economic difficulties prompted the adoption of a structural adjustment program in 1992. The program emphasizes reduction in government expenditure and the achievement of a surplus on current accounts. Control of expenditure on wages and salaries is an important mechanism for achieving these targets.

Telecommunications link Grenada with the rest of the world. Telephone systems are being upgraded and extend into all parts of the State. There are four radio stations and a single television station.

The country has an extensive network of roads, although much of it has fallen into disrepair. Reconstruction of the major arterial roads began about 5 years ago, and by 1992 was 70% complete. There are daily flights between Carriacou and Grenada, and there are regular sea connections among the three islands.

Primary and secondary education is free. There are 58 primary and 18 secondary schools throughout the islands. Opportunities for tertiary education are limited. The Saint George's University Medical School caters mainly to non-nationals, although a few nationals are awarded scholarships annually. Arrangements with subregional institutions in Jamaica, Barbados, and Trinidad give nationals access to some tertiary education. The adult literacy rate was estimated to be 75% in 1990.

Population

The population tallied in the 1991 census (94,806) was 6.4% greater than the population in 1981 (89,088), but only 93.6% of the population projected for 1990. Despite this, the Statistical Office believes that the results of the census are valid. Saint George parish, which includes the capital city of Saint George's, had the greatest concentration of population (31,994); the next largest con-

centration was in Saint Andrew parish (23,344), which includes the second largest town, Grenville.

Table 1 gives a breakdown of the 1991 population by age group and sex; 60 persons, whose ages are unknown, were excluded from the table. The population of Grenada is young, with 12,396 persons (13.1%) being under 5 years and 36,379 (38.4%) being under 15 years; 7,468 (7.9%) were aged 65 years old and older. Males exceed females in each age group up to age 30, but there are more females at all ages beyond that, so that although females represented 50.8% of the total population, they constituted 60.7% of the age group 65 years old and older.

The population's age structure has changed little between the two censuses of 1981 and 1991, although there were comparatively more adults (25 to 44 years old) in 1991 (24%) than in 1981 (18.0%). Emigration of working age persons has left a legacy of a high dependency ratio.

Birth registration is compulsory, but there are indications that the WHO definition of a live birth may not be strictly adhered to, and that some infants who die shortly after delivery may not be recorded either as births or as deaths. The crude birth rate in 1991 was 25.5 per 1,000 population. Data from census years show this rate to be declining, from 32.5 in 1960, to 29.1 in 1970, and 27.5 in 1981.

The general fertility rate declined by 45% between 1960 and 1981, from 211.5 per 1,000 women 15–49 years old to 117.8. In 1991 the rate was 124.2. The total number of live births has declined each year in the 1986–1991 period, from 3,093 to 2,429. The crude death rate was 7.3 per 1,000 population in 1991, which was not much different from the previous 10 to 15 years.

Mortality

It is difficult to obtain good quality mortality data. Complete mortality tabulations are not available beyond 1988, and the completeness of the registration of deaths and the quality of death certification are suspect. More than 10% of all deaths are ascribed to symptoms and ill-defined conditions. There is reason to believe that there may be significant underreporting of deaths in the first year of life.

Tabulations of mortality by cause are only available for sporadic years and not beyond 1988. In that year, 85 (11%) of the 756 deaths recorded were ascribed to symptoms and ill-defined conditions. Table 2 shows the leading causes of death in the general population.

Available data show that five broad groups have consistently accounted for more than 70% of mortality

TABLE 1
Population by age group and sex, Grenada,
according to the 1991 census.

| Age group | Total | | Male | | Female | |
|-------------|--------|-------|--------|------|--------|------|
| | Number | % | Number | % | Number | % |
| Total | 94,746 | 100.0 | 46,577 | 49.2 | 48,169 | 50.8 |
| 0–4 | 12,396 | 13.1 | 6,228 | 6.6 | 6,168 | 6.5 |
| 5–14 | 23,983 | 25.3 | 12,130 | 12.8 | 11,853 | 12.5 |
| 15–24 | 16,900 | 17.8 | 8,619 | 9.1 | 8,281 | 8.7 |
| 25–34 | 14,206 | 15.0 | 7,123 | 7.5 | 7,083 | 7.5 |
| 35–44 | 8,528 | 9.0 | 4,334 | 4.6 | 4,194 | 4.4 |
| 45–54 | 5,778 | 6.1 | 2,703 | 2.9 | 3,075 | 3.2 |
| 55–64 | 5,488 | 5.8 | 2,502 | 2.6 | 2,986 | 3.2 |
| 65 and over | 7,467 | 7.9 | 2,938 | 3.1 | 4,529 | 4.8 |

Note: Sixty persons of unknown age have been excluded from this table.

from defined causes. The trends for these five cause groups (communicable diseases, neoplasms, diseases of the circulatory system, conditions originating in the perinatal period, and external causes) have been analyzed, using data for 1960, 1965, 1974, 1984, and 1988.

Proportional mortality due to communicable diseases fell dramatically from 1960, when these accounted for 32.3% (289 deaths), to 1984, when they represented 6.6% (44 deaths) of mortality from defined causes. In 1988, 59 deaths were attributed to communicable diseases (8.8% of defined mortality).

Proportional mortality due to neoplasms increased from each sample year to the next, from 7.7% in 1960 (69 deaths) to 13.1% in 1988 (88 deaths).

The cause group diseases of the circulatory system has been the most significant cause of mortality. During the 1980s it accounted for approximately 40% of mortality from defined causes, up from 17.0% in 1960 (152 deaths) and 35.0% in 1974 (214 deaths).

While the proportional mortality from conditions originating in the perinatal period decreased from 17.1% in 1960 (153 deaths) to 6.5% in 1974 (40 deaths), this cause group remained significant in 1988 (31 deaths, or 4.6% of defined mortality).

The importance of external causes as a cause of mortality increased slightly since 1960, when these accounted for 3.8% (34 deaths) of deaths from defined causes; in 1988 they represented 5.8% (39 deaths).

Morbidity

Data from the General Hospital and from the rural Princess Alice Hospital show that, excluding normal

TABLE 2
Leading causes of death, Grenada, 1988.

| Rank order | Cause of death | Number | % |
|------------|--|--------|-------|
| | Total deaths | 756 | 100.0 |
| | Symptoms and ill-defined conditions | 85 | 11.2 |
| | Total, defined causes | 671 | 100.0 |
| 1 | Heart disease (390-429) | 186 | 27.7 |
| 2 | Neoplasms (140-239) | 88 | 13.1 |
| 3 | Cerebrovascular disease (430-438) | 56 | 8.3 |
| 3 | Diabetes mellitus (250) | 56 | 8.3 |
| 5 | "Accidents" (E800-E949, E980-E989) | 34 | 5.1 |
| 5 | Pneumonia and Influenza (480-0487) | 34 | 5.1 |
| 7 | Certain conditions originating in the perinatal period (760-779) | 31 | 4.6 |
| 8 | Bronchitis, emphysema and asthma (490-493) | 16 | 2.4 |
| 9 | Mental disorders (290-319) | 10 | 1.5 |
| 9 | Nephritis, nephrotic syndrome and nephrosis (580-589) | 10 | 1.5 |
| | Other defined causes | 150 | 22.4 |

deliveries and healthy live-born infants, some of the most important causes of hospitalization include conditions originating in the perinatal period, diabetes mellitus, gastroenteritis, motor vehicle accidents, complications of pregnancy and delivery, and hypertension. In 1990, the morbidity data for the General Hospital were based on inpatient discharge diagnoses, with no distinction made between principal and other diagnoses. Accordingly, they do not reflect the reason for admission, although they do provide an indication of the conditions treated.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

In the 1985-1991 period, the proportion of low birth-weight births did not change much; overall, about 9% of live-born babies had low birthweight. Infant mortality rates fluctuated in that same period, with a lowest value of 12.5 in 1989 (34 deaths) and a high of 24.2 in 1990 (64 deaths), which could be explained by differences in reporting of infant deaths. It is suspected that reporting of infant deaths is incomplete, and the infant mortality rates presented may, in fact, be too low, which is borne out by a comparison of infant mortality rates in urban and rural parishes.

Infant mortality rates over the 1988-1990 period in the rural parishes (10.8 per 1,000 live births; 33 infant deaths and 3,066 live births), surprisingly, are less than one-half those in the Saint George parish (24.7 per 1,000; 122 infant deaths and 4,945 live births). The national infant mortality rate of 19.4 per 1,000 live births for this period is probably an underestimate, and the true rate is more likely to be higher than the rate for Saint George (24.7) where reporting is better because the main hospital is located there.

In 1988, conditions originating in the perinatal period and acute respiratory infections accounted for most of the 59 infant deaths (31 deaths and 14 deaths, respectively).

Although diarrheal diseases are no longer a significant cause of mortality in infancy, they remain a major cause of morbidity. In 1990, this group of diseases accounted for 373 visits of children under 1 year old to community clinics, representing 11% (3,381) of all visits in this age group and yielding a rate of 146 per 1,000 live births. In 1990, there were 65 admissions in this age group to the General Hospital for diarrheal diseases and 26 due to pneumonia and influenza, in a total of 1,011 hospitalizations, excluding 1,029 healthy live-born infants.

Acute respiratory infections were a prominent cause of morbidity in infants, accounting for 36% of consultations at the community health clinics in this age group (1,225 consultations out of a total of 3,381). Skin conditions, chiefly scabies and bacterial and mycotic infections, accounted for 31% of infant consultations at community clinics (1,062 consultations out of a total of 3,381).

During 1991, nine deaths were recorded in the age group 1-4 years old. The main causes of mortality and morbidity in this age group were accidents and acute respiratory infections. Out of a total of 695 discharges from the General Hospital in this age group in 1990, there were 36 for asthma, 107 for ill-defined intestinal infections, and 47 for pneumonia and influenza.

That same year, there were 7,093 visits to community clinics by 1-4-year-olds. Of these, 2,665 visits (37.6%) were due to acute respiratory infections, 1,669 (23.2%) due to scabies and other skin infections, and 599 (8.0%) due to diarrheal diseases.

Mortality in the school-age population (children aged 5 to 14 years old) has been low. Nine deaths were recorded in 1988 and 13 in 1991; external causes was the only cause group with more than one death. Acute respiratory tract infections and asthma were significant causes that led to hospitalization. In 1990 at the General Hospital, there were 15 discharge diagnoses

related to pregnancy, labor, and delivery out of a total of 590 discharge diagnoses in this age group.

Adolescent and Adult Health

Fertility rates in women aged 15–19 years old have declined over the last decade; births to teenage mothers constituted 23% of total births in 1980 and 19.7% in 1991. In the 1985–1991 period, the number of live births to teenage women declined each year, from 726 in 1985 to 479 in 1991. In the 3-year period 1989–1991, teenage pregnancies resulted in 19.6% of live births.

Accidents were a significant cause of morbidity in adolescents.

Data from the psychiatric service indicate that substance abuse has increased. Consultations due to cocaine and/or crack abuse increased over the decade. Unemployment in the age group 15–24 years old exceeds 50%, and police data suggest that there has been increasing anti-social behavior.

Of the 68 persons known to be HIV-positive, 11 (16.2%) were 15–24 years old. Quantitative data on other sexually transmitted diseases are not available.

The five leading causes of death in the population aged 25–64 years old in 1990 were heart disease; cerebrovascular accidents; neoplasms; diabetes; and bronchitis, emphysema, and asthma. Hypertension contributed significantly to both heart disease and cerebrovascular accidents.

The main causes of morbidity in this age group were chronic noncommunicable diseases. In 1990, out of a total of 1,038 discharge diagnoses from the General Hospital in the age group 45–64 years old (excluding 2 for normal delivery), 112 discharges had been diagnosed as “diseases of endocrine glands other than thyroid” (including diabetes mellitus), and 148 had been diagnosed as the cause group “hypertensive disease” (ICD-9, 401–405, 98 discharges) or “other forms of heart disease” (420–429, 50 discharges).

In 1990, 411 women aged 15–44 years old were hospitalized because of complications of pregnancy, labor, and delivery, or pregnancy with abortive outcome, which represented 16.9% of all hospitalizations (2,427) in the General Hospital occurring among 15–44 year olds (excluding 1,608 normal deliveries).

For adults not admitted to hospital, the main causes of morbidity were accidents and trauma (external causes), hypertension and diabetes were the second and fifth causes, respectively, for attendance at clinics; acute respiratory infections ranked third.

In 1991, 4,308 visits to community health clinics were made by adults because of injuries. Hypertension was the reason for 1,119 such visits, followed by acute respiratory infections with 943, musculoskeletal disorders with 572, and diabetes mellitus with 499.

Health of the Elderly

In 1990, there were 1,117 discharges from the General Hospital in the age group 65 years old and older—221 were diagnosed as heart disease or hypertensive disease and 111 were diagnosed in the cause group endocrine diseases (including diabetes mellitus).

Health of Women

Mortality from diseases of the heart among women (227.8 deaths per 100,000 population) exceeded that among men (174.7 per 100,000). Studies conducted by the Caribbean Food and Nutrition Institute indicate a high percentage of anemia in women. Mortality from neoplasms of the female genitalia is high. In 1990, there were eight deaths from cancer of the cervix and eight deaths from carcinoma of the breast.

Diseases and Health Impairments

The increasing incidence of *rheumatic fever* has been particularly disturbing. There were 102 cases reported during 1984–1989, for a prevalence rate of 3.3 per 1,000 schoolchildren.

The country's only significant vector-borne disease is *dengue*. Since 1977, when Grenada was affected by the Caribbean pandemic, there have been only sporadic reported cases—one in 1989 and three in 1991 within the 1988–1992 period. All four serotypes are known to have been in evidence in the country at one time or another. *Aedes aegypti* indices averaged 8% in 1991; the mean for the Brettan index was 15.2.

Grenada has been free of *poliomyelitis* for more than two decades, and there has been no *neonatal tetanus* reported for years. *Tetanus* still occurs among adults and only one case was reported during the 3-year period 1989–1991. There have been no reports of *diphtheria* or *whooping cough* for the last 2 years.

The number of reported *measles* cases has declined dramatically since the start of the measles elimination campaign; for 1988, 1989, 1990, and 1991, the numbers of cases reported were four, two, five, and two, respec-

tively. Neither of the cases reported in 1991 was laboratory-confirmed.

Data on the microbiology of intestinal infections is scanty; despite active surveillance, no cases of *cholera* have been found.

The prevalence and incidence of *tuberculosis* and *leprosy* have been steadily declining. There have been no new cases of leprosy discovered since 1987, and there are only eight active cases on the registry, which makes the elimination of leprosy in Grenada a real possibility by the year 2000. Tuberculosis notifications have continued to decline—only four cases were reported in 1989 and one in 1990 (a total of five cases for the 1989–1991 period); no cases of miliary tuberculosis or tuberculous meningitis have been seen in the last 4 years.

A feature of Grenada has been a perceived increase in the number and severity of cases of *asthma*. Asthma is now thought to be a more important cause of morbidity than acute respiratory infections, and it was the fifth leading cause of admission to the Princess Alice Hospital.

Rabies is endemic in the country's mongoose population; but no canine or feline rabies has been reported for several years, although sporadic cases occurring in cattle have been observed. Human cases of rabies are rare—the last fatality from rabies was in the 1950s.

The first case of *AIDS* in Grenada was reported in 1984, and, since then, the cumulative total of cases has steadily increased, reaching 27 in 1991, for a cumulative incidence rate up to that point of 29.6 per 100,000. There were three new cases in 1988, eight in 1989, three in 1990, and three in 1991. Initially, transmission was mainly homosexual, but it has now become chiefly heterosexual. The highest incidence rates have been among young adult males aged 25–34 years old.

Ninety-nine cases of infectious *syphilis* were notified over the 1985–1990 period. No specific trend in occurrence was noted, with the numbers of cases being 19, 17, 10, 15, 17, and 21 in the respective years.

Information on *gonococcal infections* is extremely incomplete, but 138 cases were reported to the AIDS/STD program in 1991. Unpublished results of a 1990 survey suggest that up to 30% of gonococcal infections are caused by penicillinase-producing strains of *Neisseria gonorrhoea*.

Protein-energy malnutrition continued to decline. The numbers of children with this condition attending community clinics in 1991 (118) were significantly lower than those in 1990 (262).

Iron deficiency anemia, on the other hand, continued to be a major problem, particularly among women; 20% of the 3958 women who made a first visit to an an-

tenatal clinic were found to have hemoglobin levels less than 10 g/dl.

There were six deaths from *road traffic accidents* in 1988. Police data show that there were 876, 851, and 880 known road traffic accidents in 1990, 1991, and 1992, respectively; these accidents resulted in as many as 22 fatalities (2.4 per 10,000) in 1991, but there was only one fatality (0.11 per 10,000) recorded for 1992. It was not possible to fully analyze data from the General Hospital, but in Princess Alice Hospital, road traffic accidents was the single most important cause of admission.

Data from the police and from two mental health institutions have been used to sketch the extent of the *substance abuse* problem. Arrests for drug offenses changed little between 1987 and 1990, with 105, 124, 114, and 108 arrests in the intervening years. These increased, however, to 347 in the first half of 1991. While this may indicate more vigorous policing, it could also suggest increased usage. Marijuana was the main cause of admission for substance abuse in 1991 at psychiatric hospitals, with 87 admissions (9.5 per 10,000); alcohol accounted for 70 admissions (7.6 per 10,000) during the same year.

Of the 129 admissions to the Rathdune Psychiatric Unit in 1991, 119 (92%) were of males; males also accounted for all of the 78 admissions for marijuana abuse and for all of the 16 for cocaine abuse. Ten of the 35 admissions for alcohol abuse in the same year were of women.

Data from surveys conducted in 1979 and 1991 have been utilized to determine the trends in *oral health*. In 6-year-old children the DMF (decayed, missing, and filled teeth) index increased from 0.15 in 1979 to 1.16 in 1991, nearly an eightfold increase. For 12-year-olds, the index increased 67%, from 3.30 to 5.52, and for 15-year-olds the increase was from 5.9 to 7.2, a 22% increase.

Risk Factors

Risks in the Physical Environment

Much of the country's physical development has been linked to tourism, and it has been concentrated in the Grand Anse area. This development has been accompanied by increased discharge of sewerage into the marine environment.

Data from the Caribbean Environmental Health Institute's marine monitoring project have demonstrated an increase in the prevalence of fecal coliforms in

coastal waters between 1988 and 1992. An externally funded project is now being executed to provide for sewerage works to correct this problem.

The coastal environment, which is vital to tourism and, consequently, to the country's economy, has been further threatened by the discharge of untreated sewerage from the capital city of Saint George's. Streams and rivers have been contaminated by pesticide runoff from agricultural lands.

A detailed analysis of the 1991 census is not yet available, but it is expected to show little change from the analysis done in 1986 that showed that only 28% of households were linked to water-carriage systems for the disposal of human waste, that 61.8% had pit latrines, and 7% had no toilet facilities.

Even though the country's water supply is threatened by pollution, chemical analysis other than for residual chlorine and nitrates is not routinely done. The disposal of solid and hazardous waste has been identified as being a major problem in Grenada. Analysis of the systems by consultants in 1992 has pointed to deficiencies in collection systems as well as the absence of a sanitary landfill.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

General Policies

Falling world market prices for agricultural products and declines in tourism as a result of the recession in the industrialized world have combined to worsen an already difficult fiscal situation. The health sector has been affected by the financial problems and by the structural adjustment programs that have been put in place to overcome the difficulties.

Expenditures on areas such as supplies and equipment were reduced and much maintenance was postponed, resulting in a deterioration of the physical plant and in shortages of critical supplies such as vaccines and essential drugs, which have hindered program activities. The freezing of vacant posts has made it difficult to meet needs in critical areas.

Because the structural adjustment program is not under the aegis of the International Monetary Fund and the World Bank, external donor support for the public sector investment program has not been readily available, and although external funding has been re-

ceived for improvements in water and sanitation and for the reconstruction of the Princess Royal Hospital in Carriacou, no funds are in hand for the needed reconstruction of General Hospital in Saint George's, the main secondary hospital.

Health Policies and Strategies

The Government has endorsed the goal of health for all and has committed itself to building health services based on primary health care. It also has accepted the goals and targets of the Caribbean Cooperation in Health initiative and is endeavoring to make its health services meet them. Within these broad policy goals the Government has enunciated the following priorities:

- strengthening the health education program;
- improving environmental health services;
- upgrading legislation related to health;
- developing programs for health promotion, especially regarding healthy lifestyles;
- ensuring the elimination of measles by 1995;
- sustaining cholera prevention programs; and
- improving water supply and sewerage systems.

The highest priority has been given to human resource development, but efforts are hampered by the fact that much of the training must take place outside of Grenada at subregional institutions in Jamaica, Trinidad, or Barbados. Priority also has been given to upgrading the health facilities in Carriacou and Petit Martinique; these works are now almost completed.

The Government intends to continue exploring other methods besides general revenue for financing the health services, such as installing measures to increase cost recovery and to obtain funding from the social security systems.

The emphasis on strengthening environmental health services has been reflected in the public sector's investment program that has funded projects to extend and improve the water supply and to establish or improve sewerage in Saint George's and its environs.

The Government has emphasized programs for food protection especially since the introduction of cholera to the Americas. Efforts are hampered by the inadequacy of legislation and the scarcity of trained personnel. Grenada has participated in the Caribbean strategy and plan of action regarding food and nutrition. The Government's policy stresses local food production, and while it continues to focus on the prevention of deficiency conditions, particularly, protein energy malnutrition and anemia, it has increasingly stressed the control of nutritional factors that contribute to

chronic noncommunicable diseases such as obesity, diabetes mellitus, and hypertension.

No pharmaceuticals or biologicals are manufactured in the country. The Government provides pharmaceuticals at a minimal cost and free of charge as part of its primary health care services and seeks to reduce import costs through bulk purchases and the promotion of the rational use of drugs.

Health promotion has been emphasized in the 1989–1992 period. The programs stress the adoption of healthy lifestyles and focus on family health and the prevention and control of AIDS/STDs and chronic noncommunicable diseases.

Health legislation is in need of review, particularly in terms of mental health, environmental health, and food protection.

Organization of Services

Personal Health Care Services

Infrastructure. The country's public health system has been developed around the concept of primary health care, and health care is provided through 6 health centers (3 of which include obstetric units), 30 visiting stations, and 6 hospitals.

The public sector hospital system encompasses three general institutions: General Hospital, the main, 240-bed multidisciplinary hospital located in Saint George's; the recently refurbished Princess Royal Hospital, with 32 beds located on the island of Carriacou; and Princess Alice, a small general hospital located in Grenville in Saint Andrew.

A new psychiatric hospital has been built to replace the one that was extensively damaged during the 1983 military intervention. In addition, there is a 137-bed geriatric hospital and two special facilities, one for the handicapped and the other for substance abusers, each with 16 beds.

The private sector health care institutions are few and comparatively small—a 10-bed acute care hospital and several small nursing homes.

Secondary care institutions are currently receiving more attention in an effort to improve the quality of inpatient care. Princess Royal Hospital, which serves Carriacou and Petit Martinique, has been reconstructed to reduce the need for evacuation from these islands to the main hospital.

Coverage. The country's primary level care services follow a public assistance model, guaranteeing

that no one suffers unduly by being unable to pay at the time of need. Consequently, the target population varies, and many individuals resort to both the private and public sectors simultaneously. If both public and private sector services are considered, 100% of the population is covered for primary health care. The economic problems have increased the demands being placed on public sector facilities.

In 1991, there were 16,132 primary care level contacts with clients in Saint George parish (population 29,625), for a rate of 544 contacts per 1,000 population. Saint Andrew (population 23,531) recorded 7,298 contacts (310 per 1,000); Saint David parish (population 10,703), 7,794 contacts (728 per 1,000); Saint Patrick parish (population 9,652), 7,372 contacts (763 per 1,000); Saint John (population 8,547), 4,015 contacts (469 per 1,000); and Saint Marks (population 3,785), 3,608 contacts (950 per 1,000). Carriacou, with a population of 4,595, had 940 contacts (204 per 1,000).

The above data do not include contacts for obstetrical care and routine maternal and child care, including prenatal and well-baby care. When these are taken into account, primary health care facilities can be said to have been used extensively. The low utilization rates for Saint Andrew and Carriacou are associated with use of the hospitals at these locations for primary health care.

Immunization coverage for 1991 was 100% for measles vaccine, 82% for polio vaccine, and 85% for DPT. Vaccine shortages due to financial problems have prevented the attainment of 100% coverage for all vaccines. A measles surveillance system has been put in place, and the country expects to eradicate measles by 1995.

It has been acknowledged that the main problem with primary level care is the quality of care—there is limited access to diagnostic services, including simple laboratory tests and basic radiological investigations.

The number of available hospital beds is adequate to meet Grenada's needs. Nevertheless, although the entire population has access to hospital care, more efficient referral systems are needed.

In 1990, there were 6,824 discharges from General Hospital; the average length of stay was 7.02 days and the occupancy rate was 51.2%. Princess Alice Hospital recorded 1,224 discharges, an average length of stay of 7.08 days, and an occupancy rate of 33.8%.

Ultrasonography is available in Saint George's, but patients who require more sophisticated imaging are referred to Trinidad or Barbados. Radiotherapy is not available in the country, and often there are delays in obtaining this service in Trinidad or Barbados.

There is universal coverage for prenatal care, but registration is frequently late. Most deliveries take

place in hospital, and nearly all are attended by trained personnel.

A program to fortify flour with iron has been put in place to combat the high prevalence of iron deficiency anemia. The World Food Program is collaborating with the Government to ensure that basic foods are available and affordable.

There are not enough dental nurses to provide prophylactic care for the entire population, and their work is further hampered by shortages of material and inadequate equipment maintenance. Public sector dentists perform surgical procedures, mainly extractions.

There is no formal rehabilitation service program; however, some services are provided through two NGOs, the Society for the Blind and the Grenada Council for the Disabled. These organizations cater to the needs of approximately 1,500 disabled children and adults. In addition, there are three special schools for disabled children, and five regular schools are serviced by an itinerant teacher for the blind.

Environmental Services

The Ministry of Health is responsible for environmental protection. The entire population is covered by the basic environmental health programs delivered by the primary health services, which concentrate on peridomestic sanitation and all aspects of food protection. The Ministry also implements quarantine procedures and administers vertical programs for the control of rodents, mosquitoes, and rabies.

The Ministry of Health is directly responsible for solid waste management. There is approximately 55% to 65% coverage of the island by solid waste collection. The Government provides this service to private households and some commercial buildings, and private enterprise handles the service to hotels, private industry, and other commercial businesses.

The country's water supply comes from 29 sources; this multiplicity is dictated by the mountainous terrain. Nineteen sources are surface water and 10 are springs and/or bore holes. Water from 18 of the 29 sources (62%) is treated with sand filters and/or pressure filters and then chlorinated, while that from the remaining 11 sources is treated with chlorination only. There are, unfortunately, frequent breakdowns of the chlorination systems. Approximately 75% of households islandwide are supplied with water.

Available Resources

Human Resources

The functioning of the country's health services has been hindered by shortages of human resources in critical areas, particularly in terms of nursing, because the resources have been depleted as a result of migration. The situation regarding doctors has improved some during the last 4 years, because Grenada has benefited from returning Grenadians trained in Cuba and from graduates from the Saint George's Medical School. The country has 64 physicians (6.7 per 10,000 population), 8 dentists, and 365 nurses.

Retrenchment of public sector employees under the structural adjustment program is ongoing, and some health sector jobs have been lost. There are difficulties in filling existing vacancies, particularly the specialist physician posts.

Financial Resources

The Ministry of Health's recurrent budget was US\$ 8,016,574, an 18.3% reduction from the 1991 level of US\$ 9,817,507. Per capita expenditure which peaked in 1991 at US\$ 108, plummeted more than 20% in 1992, and when allowance is made for inflation, the reduction in real terms exceeds 20%. In keeping with the structural adjustment policies, the line item most affected by the budgetary reduction was personnel, which was reduced by more than 20% in 1992 as compared with 1991. Personnel costs have accounted for 70% of the recurrent budget in recent years: in 1992, personnel costs amounted to US\$ 5,441,423 (67.9%) of the Ministry of Health's recurrent budget.

Expenditure on institutions accounted for 52.5% of all actual expenditures in 1992, whereas expenditure on the community health services was 13%. The program's largest expenditure was the General Hospital, representing 36.8% of the budget. The Geriatric Hospital and the Psychiatric Hospital took up 12.1% of the expenditure.

Difficulties associated with the structural adjustment have severely restricted capital expenditure by the health sector. Actual expenditure on capital works in 1989, 1990, and 1991 was US\$ 356,370, US\$ 282,740, and US\$ 624,296, respectively.

GUATEMALA

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

Since 1986, the GDP has grown, and at times has climbed to quite a high rate (it reached 4.0% in 1989). During the 1986–1992 period, although the growth rate fluctuated, it was consistently higher than 3%, slightly exceeding the annual population growth rate of 2.9% for that period. Per capita GDP increased from 920 quetzales (Q 920) in 1986 to Q 937 in 1992, which shows that the country has not emerged from its impoverished condition, since those figures are well under the level of 1980, when per capita income was over Q 1,200.

Despite the GDP growth, total unemployment continues to be extremely high. The rate remained relatively stable between 1986 and 1992, but it was over 40%, which is considerably higher than the 1980 rate of 31.6%. Underemployment increased from 29.8% in 1986 to 33.7% in 1992.

Although private investment has increased in recent years, it has not been able to create a stable supply of jobs, mainly because the major employment-generating activities—manufacturing of nontraditional products and construction—are cyclical or seasonal. In urban areas, the growth of industries that manufacture or process products for export not only has generated unstable employment, but it also has created jobs that are carried out in unhealthful conditions, mainly by women.

The sharp drop in real wages has come about as a result of inflation-sparked fluctuations in general price levels. The inflation rate reached 60% in 1990, following a currency devaluation of approximately 100%, a rise in fuel prices, and the elimination of subsidies.

The proportion of the population living in poverty increased from 63.4% in 1980 to 83.4% in 1987. In those 6 years, the number of poor families rose from 846,702 to 1,268,500, which meant that there were more than 6 million persons living in poverty. The proportion of families living in extreme poverty (monthly family in-

come under the cost of the basic food basket) also increased, going from 31.6% in 1980 to 64.5% in 1987. This deterioration continued unabated, and by 1989, the proportion of poor families had risen to 89.0%. Of that proportion, 67.0% were extremely poor, which meant that more than three-fourths of the population was living in poverty.

In 1983 the cost of the daily basic food basket for five people was Q 4.82, but the minimum daily wage was Q 3.20 for rural workers and Q 3.48 for urban workers. The wage situation worsened between that year and 1990, when the cost of the daily basic food basket reached Q 13.48, but minimum daily wages stood at Q 4.50 and Q 7.04 in rural and urban areas, respectively.

In 1989, 40.7% of the population aged 15 and older was illiterate. The rate was higher among women (47.8%) than men (34.2%), and the problem was particularly severe among rural women (60%) and indigenous women (74%).

The number of children aged 7–14 enrolled in primary schools in 1989 was 1,249,143—60.5% of the total population in this age group; 39.5% of the children in this age group did not attend school. The drop-out rate was 11.8% (144,136 pupils), which signifies that 7% of children aged 7–14 dropped out of school before completing their primary education. That percentage plus the proportion of children not enrolled raises the proportion of children who fail to complete primary school to 46.5%. At the basic secondary level, the number of students enrolled was 200,422, of whom 54.1% were male and 90% urban; the drop-out rate at this level was up to 7.8%.

Population

Guatemala has a surface area of 108,889 km² and is divided into 22 departments and 328 *municipios*. Based on the 1981 census, it is estimated that the population in 1992 was 9,744,627, with an annual growth rate of 2.9% and a population density of 90 inhabitants per km². Sixty percent of the population lives in rural areas, residing in 20,017 communities, 87% of which have fewer than 500 inhabitants.

The population is unevenly distributed around the country. Almost half (45.8%) of the population—especially the rural indigenous population—is concentrated in the North, Northwest, and Southwest regions, which are less developed than the rest of the country. The area with the highest concentration of population is the capital, where 17.7% of the population resides.

Women represent 49.5% of the total population, and almost half the female population is made up of women of childbearing age. Overall, the population is quite young: 45% of Guatemalans are under 15 years of age and only 3.3% are older than 65.

The indigenous population represents 41.9% of the total and comprises 21 language groups. The composition of the indigenous population by language group is as follows: Quiché, 29%; Kakchiquel, 25%; Kekchí, 14%; Mam, 4%; and Pocomchi, Pocoman, and Tzutuhil, 24%; and the remaining 4% speak other languages. About 32% of indigenous people speak only a Mayan language, which limits their access to social services and has been a factor in social discrimination against them.

Mortality

The crude death rate decreased from 10.5 to 9.0 per 1,000 population between the 5-year periods 1980–1984 and 1985–1989, while life expectancy at birth rose from 58.9 to 62 years for both sexes (56.8 to 59.7 for males and 61.3 to 64.4 for females).

During the 1985–1989 period the highest death rate was registered among children under 1 year of age—58.7 per 1,000 live births. The next highest rate, 57.1 per 1,000 population, was among those aged 65 and over. During the 1984–1989 period, the rate among female children aged 1–4 was 11.1 per 1,000 population, slightly higher than the rate of 10.8 among males in that group. In the other age groups, males showed higher death rates. In the 15–44 age group, rates were 4.7 per 1,000 population for males and 2.79 for females, and in the group aged 45–64, the figures were 13.8 for males and 11.7 for females.

According to official records, 17.3% of all deaths occurred in a hospital, 1% in health centers, 6.3% in public places, and 75.3% at home. Almost half (44.3%) of those who died received no medical treatment and only 33% were attended by a physician.

An analysis of the causes of death according to the classification used by the National Statistics Institute reveals that for the 3-year period 1988–1990, the two leading causes of death were respiratory infections

and intestinal infections, followed by, in order of importance, conditions originating in the perinatal period, nutritional deficiencies, cardiovascular diseases, dehydration, firearm injuries, pulmonary tuberculosis, and measles. The death rate from measles rose during the years 1989–1990, when a major epidemic occurred.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

The prenatal care coverage of public institutions was 34% in 1987 and increased to 40% by 1989. The level of coverage is reflected in the number of perinatal deaths recorded during the period 1988–1990 (34,707); of that number 47.2% (16,385 deaths) were neonatal deaths and 52.8% were stillbirths. Neonatal deaths constituted 8.2% of total deaths.

During the same 3-year period, there were 47,450 infant deaths, which amounted to 23.8% of all deaths in that period. Postneonatal deaths during the period totaled 31,065, and made up 15.6% of all deaths. The infant, neonatal, and postneonatal mortality rates for the 3-year period 1988–1990 were 45.7, 15.8, and 29.9 per 1,000 live births, respectively. During the same period, there were 30,655 deaths of children aged 1–4, which constituted 15.4% of total deaths.

Health of Women

The crude birth rate decreased from 42.7 per 1,000 population during the 1980–1984 period to 40.8 in the 1985–1989 period. The total fertility rate during the same time period fell from 6.1 to 5.8 children per woman.

Only recently have the problems associated with maternal mortality come to be more fully recognized. This understanding led to a decrease in the maternal death rate in recent years, although the reliability of this indicator is difficult to assess because the exact figures are not known and are frequently underestimated. This was demonstrated by a study conducted in 1989, which revealed 50% underregistration of maternal deaths at the national level. Maternal mortality declined from 13.2 per 10,000 live births in 1986 to 9.6 in 1990.

Maternal mortality is 50% higher among indigenous women, owing to the fact that these women lack the

means to satisfy even their basic health needs. Of all the births occurring in the country, 29% are attended by medical professionals, 60% by midwives, and 8% by family members or friends; in 3% of cases the mother receives no assistance during childbirth.

The proportion of women who use some contraceptive method is quite low. From 19.2% in 1978, it increased to 25% in 1983, but then dropped back to 23.2% in 1987. In that last year, 45% of women in the department of Guatemala were using some contraceptive method, but countrywide, only 26.8% of all nonindigenous women and 5% of indigenous women were doing so. The most widely used method is oral contraceptives (23.5%), followed by female sterilization (20.7%).

Health of Special Groups

Migrant Workers. It is estimated that, on average, about 900,000 people, or 36% of the country's total rural population, migrate from the highlands to the large farms along the southern coast of Guatemala in search of work each year. The migration of these people during harvest seasons means that they often do not receive health care in their places of origin, and they also fail to receive it on the farms where they are hired; because they are temporary workers, their employers do not register them with the social security system.

Street Children. Most street children live in the capital, where their numbers are estimated at more than 5,000. These children come from unstable family environments, in which alcoholism and violence are part of day-to-day life. They work sporadically to survive, and often become involved in illicit activities, such as robbery and prostitution. As a consequence, street children have sometimes been the victims of mistreatment and abuse, including torture and murder.

The situation of girls who live and/or work on the street is particularly worrisome, since in addition to the usual risks associated with adolescence this population is exposed to sexual abuse and rape. This, coupled with the lack of sex education, raises the risk of early and unwanted pregnancies that end in abortion.

According to a study carried out by CHILDHOPE in 1992, 21% of the population of street children was between 5 and 9 years of age, 28% between 10 and 14, and the rest between 15 and 17. These young people are at risk for accidents, malnutrition, bronchorespiratory and skin diseases, poisoning by inhalation of drugs, and, especially, sexually transmitted diseases and AIDS.

Refugees. Migration intensified between 1981 and 1983, as a consequence of the country's political situation, which steadily worsened during the 1970s and early 1980s. Both migration and emigration increased, with most emigrants going to Mexico. The total number of refugees recognized by the Government of Mexico in 1992 was approximately 45,000.

In 1987, a process of voluntary individual repatriation began, and 10,357 refugees returned to Guatemala between January of that year and January 1993. The return of these refugees has caused several social conflicts, because their resettlement requires that productive lands be made available to them and that they be given access to health care and basic services, the supply of which is limited.

Diseases and Health Impairments

Vector-borne Diseases

The malarious area comprises 74% of the country's total surface area and totally or partially encompasses all of its 22 departments with the exception of Totonicapán and Sacatepequez. The number of malaria cases totaled 41,711 in 1990, 57,829 in 1991, and 57,560 in 1992. *P. vivax* was the infectious agent in 97.6%, 97.0%, and 97.4% of those cases, respectively.

In 1990, the annual parasite index (API) per 1,000 population was 11.1, very similar to what it was in 1989 (12.4). Three health regions—North, Southwest, and Petén—reported 62.3% of the cases.

The number of reported dengue cases rose from 2,315 in 1987 to 10,968 in 1991; the population at risk increased to 383,281, although the attack rate fluctuated, ranging from 5.35 in 1987 to 2.86 in 1991. Laboratory analysis was performed in 786 cases, 53.2% of which were confirmed, and serotypes 1, 2, and 4 were identified.

Vaccine-preventable Diseases

Morbidity and mortality from vaccine-preventable diseases has decreased markedly. There have been no reported cases of secondary paralytic poliomyelitis caused by wild poliovirus since September 1991, and no cases of diphtheria since 1991.

During the 1989–1992 period, 11,534 cases of measles were reported, 8,819 of them in 1990, when an epidemic was declared and 5,085 deaths occurred. In 1991 the number of cases fell to 209 and there were only 52 deaths. The disease caused no deaths in 1992.

The number of cases of neonatal tetanus declined from 103 to 21 between 1989 and 1992.

Cholera and Other Intestinal Infectious Diseases

The number of cases of acute diarrheal disease decreased from 131,866 in 1990 to 112,866 in 1991 and 99,737 in 1992. Despite these reductions, the number of cases continues to be very high in relation to the total population. Intestinal infections ranked among the five leading causes of death in all 3 years, causing 10,952 deaths in 1988, 9,502 in 1989, and 10,603 in 1990. Around 60% of the deaths were of children under age 5 (6,445 in 1988, 5,662 in 1989, and 6,600 in 1990).

Cholera struck the country in July 1991, causing 3,664 cases and 50 deaths in that year, with an incidence of 38.7 per 100,000 population and a case-fatality rate of 1.4%. In 1992, the number of cases reported by the health regions rose to 15,861, with 227 deaths, making the incidence 162.8 per 100,000 population and the case-fatality rate 1.4%.

Tuberculosis

The number of tuberculosis cases decreased from 3,046 in 1986 to 2,513 in 1992. The highest incidence of pulmonary tuberculosis occurs among the population over the age of 60. Among those aged 25–60, the rates recorded between 1990 and 1992 ranged from 40 to 55 cases per 100,000 population, which indicates widespread presence of the bacillus and the existence of environmental factors favorable for transmission. The cure rate with short-term treatment increased from 76.9% in 1990 to 82.6% in 1991.

Acute Respiratory Infections

Acute respiratory infections are one of the leading causes of mortality and morbidity. Most children suffer an average of five to eight episodes a year, which means that these infections represent a tremendous economic burden for families and for the country. The number of registered deaths from this cause was 7,424 in 1988, 7,490 in 1989, and 10,762 in 1990. The number of deaths among children under 5 in the same years was 3,658, 4,285, and 5,182, respectively (49.9%, 57.2%, and 48.2% of all registered deaths from acute respiratory infections).

Rabies and Other Zoonoses

Rabies, brucellosis, and animal tuberculosis are the zoonoses targeted by national control programs. Responsibility for activities relating to the diagnosis of these diseases rests with individuals requesting the service.

The incidence of human and canine rabies is highest in the departments of Guatemala, Quetzaltenango, Escuintla, and Suchitepequez (only canine rabies is a problem in the last department). Between 1986 and 1992, a total of 54 cases of human rabies and 1,565 cases of canine rabies were reported, although the latter figure is believed to be considerably lower than the true number of cases. The coverage of canine vaccination, which is carried out mainly in urban areas, was 32.6% in 1988, 30.4% in 1989, and 10.8% in 1990. Those levels are below the level recommended in order to achieve the elimination of this zoonosis.

AIDS and Other Sexually Transmitted Diseases

The incidence of reported cases of gonorrhea per 100,000 population was 45.4 in 1991 and 37.6 in 1992, while that of syphilis was 7.1 and 6.1 in those years, respectively.

As of 31 December 1991, the Department of Communicable Diseases, which is responsible for carrying out the National Program for the Surveillance and Control of AIDS, had received reports of 236 AIDS cases, 196 of them in men and 40 in women; of those 236 patients, 97 have died. The numbers of cases reported annually between 1984 and 1991 were 2, 5, 9, 12, 18, 18, 78, and 94. Seventy-seven percent of the reported cases have been in the 20–39 age group. The male/female ratio up to 1989 was 6.3:1; between 1990 and 1991 it fell to 4.5:1, rising again to 6.4:1 in 1992. Between 1984 and December 1990, 142 AIDS cases were reported, 36% in homosexuals and 34.5% in heterosexuals. As of April 1992, the cumulative total of cases stood at 251 (25% in homosexuals and 52% in heterosexuals).

Nutritional and Metabolic Diseases and Deficiencies

Nutritional assessments of children under 5 reveal a deterioration in their nutritional status, with an alarming rise in acute malnutrition (weight-for-height). Among children under 5, according to weight-for-height data collected by the Nutritional Surveillance

Subsystem, which was implemented in 1988 in eight health regions, the prevalence of acute malnutrition tripled between December 1988 and March 1990, rising from 2.6% to 6.5%. Weight and height deficits among children under 3 differ markedly between rural and urban areas and between nonindigenous and indigenous children. The proportion of children showing a weight deficit is 25.7% in urban areas and 36.6% in rural areas, and it is 28.6% among nonindigenous children and 40.6% among indigenous children. As for height deficit, the proportions are 47.2% in urban areas, 62.0% in rural areas, 48.2% among nonindigenous children, and 71.6% among indigenous children.

Among schoolchildren aged 6–9, malnutrition is most prevalent in the Northwest and Southwest regions, where the rates are 52.2% and 47.9%, respectively. In June 1990, assessments of 74,000 children under the age of 5 were conducted in the various health regions, and 41.2% were found to be suffering from either moderate (1–2 standard deviations below the mean) or severe (more than 2 standard deviations below the mean) acute malnutrition.

In 1979, the prevalence of endemic goiter was 8%. By 1989 it had increased to 20.4% as a consequence of notable deterioration in the salt iodization program. In 1991, a study of schoolchildren revealed an incidence of 22%. The highest incidence of goiter in the country (33%) has been reported in the Northwest region. The prevalence of vitamin A deficiency among children decreased from 26.2% in 1984 to 9.2% in 1989 thanks to a mass vitamin A supplementation campaign carried out in 1988.

Malignant Neoplasms

During 1988–1990, the cancer registry received reports of 4,616 cases of cancer in females and 1,584 cases in males, yielding a male/female ratio of 3:1. However, the data in this registry are quite biased, because cancer of the uterine cervix is the only type for which a special program exists and therefore reported cases of this cancer far outnumber those of other types. During the period in question, 41% of all cases reported were of cervical cancer. Among the 1,584 reported cases in males, the five most frequent sites of malignancy were: skin, 261 (21.3%); stomach, 163 (10.3%); prostate, 118 (7.4%); lymphatic system, 78 (4.9%); and testis, 77 (4.9%). The five most frequent sites among the 4,616 cases in females were: uterine cervix, 2,547 (55.2%); breast, 416 (9.0%); skin, 316 (6.8%); stomach, 144 (3.1%); and ovary, 128 (2.8%).

The death rate from cancer of the uterine cervix increased from 15.5 per 100,000 women in 1985 to 17.0 in 1989, decreasing slightly to 16.6 in 1990. The distribution of cervical cancer by place of residence indicates that of the 5,028 cases reported during the 1985–1990 period, 3,376 (67.1%) occurred in urban areas. By ethnic group, 84.6% of the cases were diagnosed among the nonindigenous population and 9.4% among the indigenous population (the ethnic origin of the patient was not reported in 5.8% of cases).

Accidents

Accident rates in 1989 and 1990 were 200 and 150 per 100,000 population, respectively. Of all the accidents reported, 35.5% in 1989 and 40% in 1990 were occupational accidents, while 64.5% in 1989 and 59.1% in 1990 were non-occupational accidents. There is a clear preponderance of male accident victims, with rates of 109.8 for males and 39.2 for females. Accidents are most common in the 5–14 and 15–44 age groups, accounting for 24.3% and 54.1% of all cases and deaths in these groups, respectively.

Oral Health

A study in 43 communities, conducted by the San Carlos University between 1981 and 1983, found that adolescents aged 12–15 showed evidence of severe decay in more than 50% of their teeth. The study also found that 94% of the population had oral diseases. The average decayed, missing, or filled teeth (DMF) index for the general population is 7. Because of poor oral health, many people experience difficulty in eating. The high DMF level is associated with low fluoride consumption and deficient oral hygiene.

Risk Factors

Risks in the Physical Environment

In 1992 water was being supplied to 57% of the homes in the country. In central urban areas 87% of the population was supplied with drinking water, whereas in settlements on the urban periphery the figure was only 40%. Of the latter proportion, only 4.5% had house connections. Water supply coverage in rural areas was 49%.

Seventy-five percent of the homes in the country had some type of sanitation system. In urban areas, wastewater is disposed of through sewerage systems that serve 82% of the country's urban population. In rural areas, 51.6% of the population has sanitary latrines. Despite efforts to expand wastewater treatment, only 6% of all municipal wastewater is treated. Of the 40 treatment plants in the country, only 20% are operating.

In response to the cholera epidemic that struck the country in 1991, the use of chlorine in municipal water systems has doubled. In 1991, 48 systems were chlorinating their water supplies and by 1992 the number had increased to 94; nevertheless, only 45% of the total urban population is served by those 94 systems.

There are no systems in any city in the country for adequate final disposal of solid waste, and all such waste is disposed of in open-air dumps. With the increase in the volume of nonbiodegradable waste, the dumps have become increasingly contaminated. The Guatemala City metropolitan area produces more than 1,000 tons of solid waste per day.

Air pollution in the department of Guatemala has increased markedly, owing mainly to the concentration of industry there and an increase in the number of motor vehicles. Chlorofluorocarbons, a propellant in aerosol sprays, continue to be used without any restriction. Leaded gasoline also continues in use.

Pesticides, which are employed in large amounts in the agricultural sector, have become one of the principal sources of environmental pollution. An estimated 4.5 million kg of pesticides were applied in the country in 1990, which is the equivalent of 0.56 kg per person. The majority of pesticide poisoning cases occur among workers aged 15–29 and are associated with exposure to organophosphate and carbamate insecticides. In general, cases of pesticide poisoning are underreported.

Contamination of Food

One of the most frequent causes of morbidity and mortality in Guatemala, especially among children, is the consumption of contaminated foods. A considerable number of cases of the principal gastrointestinal diseases are linked to this transmission route. Tests of specific food groups conducted in 1992 found that 71% of the samples of processed foods analyzed met the sanitary standards in effect. Major efforts have been made to improve the quality of milk and milk products; the proportions of samples found to be acceptable

were 11% in 1987, 28% in 1988, 10% in 1989, 28% in 1990, 20% in 1991, and 50% in 1992. With regard to food sold by street vendors, 52% of samples from the departments and 48% of samples from the capital were found to be microbiologically acceptable in 1992. Those figures represent an improvement over the 34% level of acceptability found in 1991, prior to the outbreak of cholera in the country.

The first recorded outbreak of paralytic shellfish poisoning (red tide) occurred along the southern coast in the months of July and August 1987. Out of the 187 cases reported, there were 26 deaths, for a case-fatality rate of 14%—considerably higher than the world average of 8.5%. The poisoning was caused by ingestion of shrimp and a variety of small clam in which the dinoflagellate responsible for the disease was detected. In 1989 the same dinoflagellate caused another outbreak, which affected an area stretching from Panama to Mexico. In that outbreak seven cases of poisoning were reported in Guatemala, with no deaths. Subsequently, nine more outbreaks of poisoning have been reported, as a result of which alerts were issued and the population was warned not to consume mollusks and shrimp from certain areas along the southern coast.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

One of the objectives of the process of civil transition that began in 1986 was to gradually create a new form of State organization based on the strengthening of municipal governments, administrative and financial decentralization, and regionalization. These elements of the reform of the State and the government apparatus are embodied in the country's Constitution, which went into effect in 1986, and in other general and specific laws enacted since that year.

Guatemala's monetary and fiscal policies were crucial factors in the economic recovery that took place between 1986 and 1992. During the period 1986–1990 economic policy was oriented toward bolstering foreign trade through the implementation of several programs, including the Program for Economic and Social Change, the National Reorganization Program, and the 500-Days Plan, all of which sought to increase exports.

Since 1991, the country's economic policy has sought to stimulate private investment through fiscal

measures, such as reduction of the maximum income tax rate from 36% to 25% for those in the highest income bracket. However, there have been no substantive changes in the tax structure that would enable fiscal authorities to significantly increase financial revenues. As a result, the level of public investment has fallen, and the country has had to continue to resort to external borrowing as a compensatory mechanism, despite the fact that the value-added tax is now being applied to all products, even the most basic goods and services.

During the period 1986–1992 exports rallied somewhat, rising from US\$ 1,044 million in 1988 to US\$ 1,245 million in 1991. Generally speaking, during this period traditional export products continued to be the mainstays of the country's export activity, as well as the primary source of foreign currency earnings. In some years these products made up more than 60% of total exports. Nontraditional export products (lumber, flowers, cardamom, and others) have become increasingly important, however, and currently generate approximately 20% of total foreign currency earnings. Between 1986 and 1991 exports to other Central American countries increased 72%, while those to the rest of the world grew by 77%; this dynamism in the export sector may provide an impetus for recovery.

The external debt of the public sector decreased from US\$ 2,516 million in 1986 to US\$ 2,112 million in 1992. Although this appears to be a significant reduction for the sector as a whole, in fact it was largely due to a decrease in the debt of the Bank of Guatemala, which fell from US\$ 1,224 million to US\$ 683 million (that is, more than 50%) during the same period. Nevertheless, the external debt of the rest of the public sector has not continued to increase at the same pace as during the first half of the 1980s (the debt almost tripled between 1980 and 1983), as evidenced by the fact that between 1986 and 1992 the debt rose only 10%, from US\$ 1,292 million to US\$ 1,429 million.

The bulk of the workforce continues to be employed in agriculture. According to a sociodemographic survey carried out in 1989, of the 2,840,000 people who made up the economically active population (EAP), almost 50% were working in activities relating to farming or livestock-raising, 13.7% in manufacturing, and 13.2% in commerce. The female component of the EAP continued to be small—only 25.2% of the total. However, in certain realms women have become an important presence. For example, in the manufacturing industry 42.8% of the workforce is female; in commerce, 54.9%; and in community and social services, 50.5%.

Human Rights

Internal armed conflict, which as of 1992 had been ongoing in the country for 32 years, continues to be a source of grave human rights violations committed by warring factions. According to the office of human rights of the Archbishop of Guatemala, in 1991 there were 551 extrajudicial executions, 205 political murders, 231 abductions, and 23 cases of torture.

The advances made by the Presidential Commission on Human Rights to improve this situation include the publication of an updated report on the principal cases of human rights violations. The army also continued to carry out its human rights programs, and the office of the Attorney General for Human Rights allocated more resources to prevent the abuse of street children.

In the framework of the Esquipulas agreement and in accordance with the Oslo procedure, a national peace initiative based on four basic premises was made public. Those premises are: cessation of armed conflict; greater economic and social equity; respect for and strengthening of the rule of law; and fortification of the democratic process.

Health Policy

The objective of the health policy for the period 1991–1992 was to achieve greater efficiency through more effective utilization of the budget, the operating capacity of existing facilities, and human resources, as well as through good management and a more equitable distribution of health services, with greater autonomy, participation, and control by the community. The policy sought to give priority to programs and projects designed to benefit the poorest and most at-risk segments of the population, including pregnant and nursing women and malnourished children.

Given the magnitude of the deficiencies in existing health services, the Government undertook actions aimed at significantly increasing the budgetary resources allocated for health, channeling those resources into primary and preventive care and toward the regular budget for maintaining and adequately equipping existing health facilities.

The following strategies were adopted to strengthen preventive care: promotion of health education through the use of appropriate technology; expansion of the supply of sanitation and drinking water services, with priority given to rural and urban fringe areas and with community and municipal government participation; provision of adequate supplies and

human resources to health centers and posts in order to increase health care coverage; and strengthening of programs designed to address controllable causes of morbidity and mortality, such as diarrheal and respiratory diseases.

In the area of maternal and child health, the strategy was to step up feeding and immunization programs, utilizing community personnel who were already carrying out health-related activities. The strategies relating to food and nutrition policy were the following: to exercise the greatest possible institutional effort to ensure food security for the population, with priority attention to mothers and children suffering from acute nutritional deficiencies; to redirect the delivery of foods in order to provide a balanced diet for this group; to intensify the program promoting the practice and continuance of breast-feeding; and to institutionalize the enrichment of staple foods, particularly the iodization of salt and fortification of sugar with vitamin A and iron.

Several institutions and ministries have responsibility for setting policies on food safety and control, including the Ministry of Public Health and Social Welfare; the Ministry of the Economy; the Ministry of Agriculture, Stock-raising, and Food; and the municipal governments, which are responsible for inspecting slaughterhouses and street food. Food inspection activities are overseen mainly by the Ministry of Public Health through the Division for Food and Drug Registration and Control. Outside Guatemala City, most control activities are carried out by health centers.

Organization of Services

The health sector is characterized by a low degree of formal administrative and legal structure and by the involvement of many institutions, from diverse sectors, in the production, marketing, or delivery of various types of health services. The sector includes public and private institutions, nongovernmental organizations, and a sizable and important segment of traditional practitioners with roots in the Mayan culture. Administratively, the health services system is divided into eight health regions.

In 1990 the total coverage of health services was 54%, distributed as follows: 25% of the population was covered by the Ministry of Public Health and Social Assistance, 15% by the Guatemalan Social Security Institute (IGSS), and 14% by the private sector. Forty-six percent of the population lacked coverage.

Personal Health Care Services

In 1989 there were 3,868 health care establishments distributed throughout the country. The breakdown by level of care was as follows: 155 hospitals, 32 type-A health centers with beds, 188 type-B health centers without beds, 35 outpatient clinics, and 3,458 small health care establishments, including health posts, clinics, and others.

The public sector consists of the Ministry of Public Health, which operates 27% of all the health establishments, the IGSS, which operates 2%, and other institutions of lesser importance, such as the armed forces health services, which account for 1.5% of the total number of establishments, and municipal health services, which account for 0.5%. The private institutions in the sector operate 52% of all the health care establishments and nongovernmental organizations operate 17%. The Ministry manages 785 health posts distributed throughout the country, the IGSS has 6 health posts and 16 first-aid stations, and the military and police forces operate 24 health posts.

At the secondary care level, the Ministry operates 220 health centers, 32 with beds and 188 without. The IGSS runs 35 outpatient clinics, and the armed forces have 21 infirmaries with beds for recuperation from illness or minor on-site surgery. At the tertiary care level, there are 35 Ministry hospitals, 7 of them specialized, with a total of 8,726 beds; the IGSS manages 27 hospitals (4 specialized) with 2,237 beds; and the armed forces operate 6 hospitals with a total of 492 beds. Additionally, 83 hospitals with 2,463 beds are managed by private institutions and 4 hospitals with 122 beds are operated by nongovernmental organizations. The distribution of the primary and secondary level Ministry services is in accord with the distribution of the population. However, tertiary care facilities are concentrated in the capital, where the ratio of beds to 1,000 population is 2.1, as contrasted with the national average of 0.9. In some highland departments the ratio is as low as 0.1 to 0.4 for every 1,000 people.

The geographic coverage of IGSS services is scant. At the secondary and tertiary levels, in particular, services are concentrated in the Guatemala City metropolitan area. IGSS health posts and first-aid stations are located in only nine departments, and there are IGSS outpatient clinics in only 10 departments; moreover, 31% of these facilities are in the department of Guatemala. In 1989, IGSS coverage for sickness, maternity, and accidents was extended to the department of Escuintla, with emphasis on primary care.

The private clinics and hospitals are located mainly in the department of Guatemala and in urban areas, but no precise data on their distribution are available.

The Ministry health posts and the IGSS first-aid stations are staffed exclusively by auxiliary personnel and are equipped to perform only basic clinical diagnosis. They have very limited supplies of drugs and first-aid materials. The health centers are staffed by full-time physicians, nursing personnel, rural health technicians, environmental sanitation inspectors, and administrative personnel. The type-A centers have beds for maternal and child health care. All health centers offer laboratory services, and some also are equipped to provide X-ray and dental services. All the general hospitals operated by the Ministry and the IGSS offer four basic specialties: general medicine, surgery, pediatrics, and obstetrics and gynecology. The specialized hospitals are concentrated in the capital.

It is estimated that the current value of the health care delivery infrastructure of the Ministry and the IGSS is US\$ 800 million, including equipment, facilities, and physical plants. Of the equipment in Ministry establishments, 60% works satisfactorily, 25% works sporadically, and 15% is not operational. Equipment deterioration is particularly prevalent in the areas of diagnostic imaging, food and laundry services, refrigeration, and air conditioning. The average age of the physical plants of Ministry hospitals is 31 years, that of IGSS hospitals is 10 years, and that of IGSS clinics and health posts is 13 years.

Drugs are marketed through a network of public and private pharmacies. The private sector includes 818 class-I pharmacies, 762 class-II pharmacies, and 760 drug stores. The class-I pharmacies are staffed by a professional pharmacist and are authorized to dispense stupeficient and psychotropic drugs. The class-II pharmacies are staffed by a technician without professional-level training and do not sell stupeficient or psychotropic drugs. The drug stores include all small general stores or supermarkets that sell drugs to the public. The public sector drug distribution outlets—excluding the health services—consist of 53 government-operated pharmacies and 104 municipal drug stores. In November 1992 a total of 6,822 pharmaceutical products were registered by the drug regulatory agency for sale in Guatemala, 34.6% of which were domestically produced. The production of compound drugs has decreased while the manufacture of single-ingredient drugs has increased and now accounts for 66% of total drug production. The five categories of drugs for which demand is highest are antibiotics

(40%); analgesics and anti-inflammatories (8.7%); amebicides, parasiticides, and anthelmintics (8.6%); antacids and antagonists (8.6%); and vitamins (5.1%).

According to local industry estimates, in 1989 the pharmaceutical market amounted to US\$ 100 million, 24% of which corresponded to purchases by the public sector (Ministry and IGSS). In 1992 the amount declined to US\$ 87.9 million.

Vaccination Coverage

The Expanded Program on Immunization (EPI) was established in the country in 1982. In 1985 vaccination coverage of children under 1 year was less than 10%, but by 1990 this proportion had increased to more than 60%.

Despite this progress, however, vaccination coverage continues to be deficient. Between 1989 and 1990 coverage among children under 1 year rose from 64% to 74% for OPV, from 60% to 68% for the measles vaccine, and from 43% to 56% for DPT; coverage for tetanus toxoid among women of childbearing age increased from 22% to 27%. The next year coverage for the under-1-year group fell to 69% for OPV and to 48% for the measles vaccine. Coverage with BCG declined from 61% in 1990 to 43% in 1991, and tetanus toxoid vaccination coverage among women of childbearing age dropped from 27% in 1990 to 12.5% in 1992.

The principal constraints on the program are a shortage of public health financing and the fact that over half the population lacks access to services. These factors, coupled with the need to channel large amounts of resources into combating the cholera epidemic in 1991, explain the decline in vaccination coverage levels.

Environmental Services

Drinking water and sanitation services in the Guatemala City metropolitan area are the responsibility of the Municipal Water Company. In other urban areas these services are provided by the Municipal Development Institute, which serves 329 towns and is the entity responsible for establishing treatment plants in those locations. The Ministry of Public Health is in charge of water supply and latrine-building in rural areas; the Division of Environmental Sanitation and the Rural Water Supply Unit are the Ministry's executive agencies for these activities.

Available Resources

Human Resources

Employees of the public health sector make up 0.9% of the EAP. This proportion is reduced to 0.4% if only those employees with some training in health care are considered. These are the workers who carry out preventive and curative activities among the 90% of the country's population living in poverty.

The Ministry of Public Health and Social Assistance is the principal employer in the sector, with 19,385 employees who constitute 71.3% of the labor force in the public health sector. The composition of the work force by level and area of training is as follows: professionals, 12.4%; technicians, 8.8%; auxiliaries, 26.5%; and administrative and general services personnel, 52.3%. Males make up 60% of the work force in professional categories, but their predominance is especially marked in the case of physicians, 90.4% of whom are male. Nursing personnel, auxiliaries, and social workers, on the other hand, are predominantly female.

Health personnel (with the exception of rural health technicians and volunteers) are concentrated in the Guatemala City metropolitan region, where the ratio of professionals to population is 4 per 10,000—double the national average.

In rural areas, where the majority of the population lives and where the highest-risk groups are concentrated, the population is served by auxiliary nursing personnel, rural health technicians, community volunteers, midwives, and rural health workers. In 1989 the Ministry's volunteer personnel included 12,270 trained midwives and 14,012 rural health workers.

The IGSS has two types of employees—full-time staff members with permanent posts, who in 1989 numbered 7,816, and temporary personnel who are retained

on short-term contracts and numbered 1,357 in 1989. More than three-fourths (79.5%) of all IGSS human resources are concentrated in the metropolitan region; the Central and Southwest regions have the next highest proportions—8.8% and 6.4%, respectively.

Two universities provide training for professional health personnel: San Carlos University and the Francisco Marroquín University. Between 1988 and 1991, a total of 1,581 physicians were graduated, of whom 1,090 were male and 491 female. The numbers of dentists and nurses graduated during the same period were 256 and 359, respectively.

Training for mid-level technical personnel, including nursing auxiliaries, has mostly fallen to various institutions of the Ministry, which operates three schools of nursing, four schools for nursing auxiliaries, one for diagnostic radiology technicians, one for physical and occupational therapists, and one for the training of health personnel (INDAPS). Between 1988 and 1991, a total of 1,058 technicians and 2,039 nursing auxiliaries (344 males and 1,695 females) graduated from these schools.

The training and supervision of community volunteers is carried out by the Ministry, international agencies, and national and international nongovernmental organizations.

Financial Resources

The proportion of the national budget allocated to the Ministry of Public Health and Social Assistance ranged from 7.4% in 1987 to 9.3% in 1991. In 1986 spending by the Ministry amounted to 1% of the GDP. Ministry spending rose to its highest level, 1.3% of the GDP, in 1988 and 1989, and subsequently declined to 0.9% in 1990 and 1991.

GUYANA

GENERAL HEALTH SITUATION AND TRENDS

Guyana lies on the northeastern coast of South America, and extends for 215,000 km². In October 1992, a new Government was elected to office, marking the first change of political party in power since the country's independence from Great Britain in 1966. According to the new Government's first budget presented in March 1993, the country's economy had stagnated between 1965 and 1991, and the annual per capita income had risen by only 5.88%, from US\$ 340 to US\$ 360, during that period. The document also revealed that average income and living standards had dropped, and that the burden was borne principally by the poor and underprivileged.

Health and Living Conditions

In 1987, expenditure in the health sector represented less than 4% of total recurrent and capital expenditures, and this figure had increased to 8.53% in 1992. By 1993, the allocation to the health sector had risen by 37.89% over the 1992 allocation, resulting in an allocation to the health sector that represents 10.6% of the country's 1993 budget.

In 1992, the illiteracy rate was estimated at 4% (2% for males and 6% for females); 52.5% of the population had attained the primary-school level, 34.5% had attained secondary-school level, and 10% had attained a level higher than secondary education.

In 1990, 12.5% of the country's population had no access to health services, an increase from 11% during 1987-1989; 25% had no access to safe water and 12.5% had no access to sanitation.

The crude birth rate was 25.5 per 1,000 population in 1985, 26.5 in 1989, and 24.1 in 1992. The total fertility rate was 3.0 per woman in 1985, 3.1 in 1990, and was reported at 2.8 per woman in 1992. The crude death rate was 6.6 per 1,000 population in 1985, rose to 8.0 in 1988, and was reported at 7.0 in 1992. The infant mortality rate per 1,000 live births was 43.9 in 1985, rose to 47.0 in 1988, and dropped again to 42.9 in 1992. It is es-

timated that the life expectancy for women in 1992 was 67.7 years, and that of men was 62.1 years.

Between January 1990 and July 1992, the minimum wage of public service employees increased by 242% while the average minimum cost for a nutritionally balanced diet of 2,400 calories per person increased by 181.9%. Nevertheless, during the same period the lowest level wage earners, who depend solely on their wages for food and other necessities, may have been compromising their nutritional well being, because their wage increases did not cover food cost increases. The devaluation of the Guyana dollar also had a negative effect.

Homelessness and vagrancy are becoming major problems, and persons of all ages, gender, and ethnic groups commonly resort to begging.

Population

The country's population has dropped since 1985, mainly due to international migration; net migration from 1980 to 1989 averaged -1.6% each year. The estimated population in 1991 was 739,553 inhabitants. The country also has experienced an internal migration, resulting in an urban population increase from 30.9% of the total population in 1985 to 32.2% in 1992.

The population's structure in 1992 is approximately the same as it was when the Guyana Retrospective Demographic Survey was carried out in 1986: males represented 49.2% and females 50.8% of the total population. In terms of age distribution, the age group 0-14 years old represented 36.8% of the population, the age group 15-64 years old represented 59.3%, and the age group 65 years old and older represented 3.9%.

A 1993 survey of female prostitutes in Georgetown revealed that Amerindians represented approximately 10.2% of female prostitutes in the city, although it is estimated that this ethnic group represents less than 1% of the population in Georgetown.

Mortality

There are two reporting systems for birth and death registration in the country: one is run by the General

Registrar's Office, and the other, by the Ministry of Health's Health Statistics Unit. Although there are no clearly defined reasons for having two reporting systems, it has been said that the General Registrar's Office does not provide timely data that could be used for epidemiologic purposes. However, it is the General Registrar's Office that is responsible for providing national statistics on births and deaths. More than 90% of the estimated number of births in the country are registered by the General Registrar's Office. The Health Statistics Unit, which was strengthened during 1992, registered approximately 82% of the estimated number of births in 1992. Of the 14,537 births registered by the Health Statistics Unit in 1992, 88.4% were institutional and 11.6% domiciliary. The southern region of the country, bordering Brazil and inhabited mainly by the indigenous Amerindians, was reported as having registered 112 births in 1992, of which 61 (54.5%) were domiciliary.

Approximately 94% of the deaths occurring in the country are registered, and all registered deaths must be medically certified. The available mortality data show that 4,652 deaths were reported in 1990, 15.7% more than the 4,021 deaths reported in 1988.

Data on deaths from ill-defined causes are unavailable. The 10 leading causes of death reported were the same for both 1988 and 1990, and these were responsible for 2,783 (69.3%) of the deaths for all ages in 1988, as compared with 3,124 (67.2%) in 1990 (Table 1). Their rank and percentages for 1990 were: cerebrovascular disease (ICD-9, 430-438), representing 16.7% of deaths; ischemic heart disease (410-414), representing 9.1% of deaths; diseases of pulmonary circulation (415-417) and other forms of heart disease (420-429), representing 7.9% of deaths; diseases of "other" parts of the digestive system (530-579), representing 6.3% of deaths; endocrine and metabolic diseases and immunity disorders (240-259; 270-279), representing 6.0% of deaths; "other" diseases of the respiratory system (466, 480-519), representing 6.0% of deaths; hypertensive disease (401-405), representing 5.6% of deaths; certain conditions originating in the perinatal period (760-779), representing 3.5% of deaths; intestinal infectious diseases (001-009), representing 3.4% of deaths; and "other" accidents, including late effects of accidental injury (E900-E929), representing 2.7% of deaths. It was observed that cerebrovascular disease, ischemic heart disease, diseases of pulmonary circulation, and hypertensive disease accounted for 35.3% of the deaths for all ages in 1988 and 39.3% in 1990.

Although it would be more appropriate to determine these percentages with reference to total deaths from defined causes, the available data from the

Health Statistics Unit did not make that possible. It has been observed that some of the above-mentioned causes are, in fact, residual categories, and that malignant neoplasms do not appear as a leading cause of death. This probably reflects the fact that the data collection system has room for development.

Although hospitalization data was poorly recorded and analyzed in the past, in 1992 the Health Statistics Unit endeavored to improve this situation, resulting in the leading causes of hospitalization being reported at 13 of the country's 16 district hospitals.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

In 1990, the Health Statistics Unit reported that conditions originating in the perinatal period was the leading cause of death for infants under 1 year old, and it was responsible for 30.9% of the 525 deaths reported that year. Intestinal infectious diseases was the second leading cause group for deaths in this age group, and it was the leading cause of death in the age group 1-4 years old. Nutritional deficiencies was the third major cause of death among infants under 1 year of age and the second leading cause in the age group 1-4 years old. The available data also reveal that other diseases of the respiratory system, the fourth leading cause of death among infants under 1 year of age, was the third leading cause of death among the age group 1-4 years old. The first three major causes of death in the age group under 1 year old could be reduced through effective preventive care. The incidence of deaths suggests that prenatal and postnatal services may be limited or inadequately used, and that water and sanitation conditions are unsatisfactory, although it has been reported that 84.2% of the country's population had access to safe water.

Data are not available from all hospitals in the country, but information from Georgetown Public Hospital, the country's largest hospital, reveals that during 1990-1991, the major causes of admissions to the pediatric ward for children under 1 year of age, excluding infectious diseases, were respiratory conditions, substance ingestion, convulsive disorders, anemia, cardiac conditions, thalassemia, and nephrotic syndrome.

For children 1-5 years old, the leading causes of admission were substance ingestion, respiratory conditions, convulsive disorders, anemia, nephrotic syndrome, thalassemia, cardiac conditions, and sickle cell

TABLE 1
Ten leading causes of reported deaths, by sex, Guyana, 1988 and 1990.

| Leading causes of death (ICD-9 code) | Deaths and order in 1988 | Total deaths by sex for 1988 | | Deaths and order in 1990 |
|--|--------------------------|------------------------------|--------|--------------------------|
| | | Male | Female | |
| Cerebrovascular disease (430-438) | 592 (1) | 344 | 248 | 775 (1) |
| Ischemic heart disease (410-414) | 361 (2) | 216 | 145 | 424 (2) |
| Diseases of pulmonary circulation and other forms of heart disease (415-429) | 264 (4) | 143 | 121 | 368 (3) |
| Diseases of other parts of the digestive system (530-579) | 260 (5) | 176 | 84 | 291 (4) |
| Endocrine and metabolic diseases, immunity disorders (240-259, 270-279) | 220 (7) | 95 | 125 | 279 (5) |
| Other diseases of the respiratory system (466, 480-519) | 328 (3) | 184 | 144 | 279 (5) |
| Hypertensive disease (401-405) | 200 (8) | 96 | 104 | 260 (7) |
| Certain conditions originating in the perinatal period (760-779) | 194 (9) | 100 | 94 | 165 (8) |
| Intestinal infectious diseases (001-009) | 222 (6) | 127 | 95 | 157 (9) |
| Other accidents including late effects (E900-E929) | 144 (10) | 111 | 33 | 126 (10) |
| Total deaths, all causes | 4,021 | 2,299 | 1,722 | 4,652 |

Source: Health Statistics Unit, Ministry of Health, Guyana, 1993.

anemia. Children 6-12 years old were most frequently admitted to the hospital for respiratory conditions, nephrotic syndrome, anemia, cardiac conditions, sickle cell anemia, convulsive disorders, and substance ingestion. The leading causes of admissions to Georgetown Public Hospital were diarrhea, malnutrition, and respiratory infections.

Ministry of Health data reveal that during 1988 there were 146 deaths reported among children aged 1-4 years, compared to 128 in 1990. The cause group symptoms, signs, and ill-defined conditions (780-799) was reported in 3.1% of the deaths. In both 1988 and 1990, intestinal infectious diseases (001-009) were reported as the leading cause of death. This cause represented 28.1% of the deaths in 1988 and 24.2% in 1990.

In 1990, nutritional deficiencies (260-269) was reported as the second major cause of death, and it was responsible for 18.0% of all deaths in the age group 1-4 years old; this cause was reportedly the fourth major cause in 1988, responsible for 6.9% of the deaths.

Other diseases of the respiratory system (466, 480-519) was the third major cause in 1990, when it represented 10.2% of the deaths in the age group 1-4 years old; in 1988, it was the second major cause of death, responsible for 20.5% of those reported.

The category diseases of blood and blood forming organs (280-289) was responsible for 7.0% and ranked fourth among the major causes of death in 1990; in

1988 it was reportedly the cause of 2.7% of the deaths. Diseases of the nervous system (320-359) was the fifth major cause of death in the age group 1-4 years old in 1990, and was responsible for 6.25% of the deaths; it was not reported among the 10 major causes of death in 1988.

Homicide and injury purposely inflicted by other persons (E960-E969) was the sixth major cause of death in 1990, and was responsible for 5.5% of the deaths; in 1988, it was responsible for 6.2% of the deaths and was the fifth major cause that year. Other accidents, including late effects of accidental injury (E900-E929), was reported as the seventh major cause of death in 1990, and accounted for 3.9% of deaths in the age group 1-4 years old; in 1988, it was the sixth major cause of death and represented 6.2% of the deaths.

The eighth major cause in both 1988 and 1990, was diseases of pulmonary circulation (415-417) and other forms of heart disease (420-429), representing 4.1% and 3.9% of deaths, respectively.

The ninth leading cause of death in 1988 was other violence (E970-E999), representing 2.7% of the deaths in the age group 1-4 years old. It was not reported among the 10 major causes of death in this age group in 1990.

Most striking is the fact that, when deaths in the age group 1-4 years old classified as (a) homicides and injury inflicted by other persons, (b) accidents, and

(c) other violence are combined, they were responsible for 15.1% of all deaths in that age group in 1988 and 9.4% of all deaths in 1990.

In 1991, of the live births recorded for which a weight also was recorded, 17.9% weighed below 2,500 g. Approximately 10% of the total births did not have their weights determined and/or recorded, particularly in the country's more economically depressed regions.

In 1991, of 114 deaths due to nutritional deficiencies, 57.9% occurred among children under 1 year old, and 15.8% occurred among 1–4 year olds. Marasmus was not reported but 8.8% were reported as having died of kwashiorkor, and 91.2% died of other protein-calorie malnutrition. It was estimated that during 1980–1990, 22% of children under 5 years old were underweight, 9% of those aged 12–23 months had wasting, and stunting occurred among 21% of those in the 24–59 months age group.

Through the Expanded Program on Immunization, coverage with BCG, DPT, OPV, and measles vaccines increased throughout the country. Coverages for 1988 and 1992 were 64.0% and 87.6% for BCG; 64.3% and 79.3% for DPT; 69.4% and 87.1% for OPV; and 55.0% and 73.4% for measles vaccine. Available data reveal that epidemics of some diseases preventable by immunization occurred during 1988–1992; 29 rubella cases were registered in 1992, and no cases in 1990 or 1991.

Adolescent and Adult Health

Very little information is readily available about adolescent health. During 1988–1990, the age group 10–19 years old, representing 25.9% of the population, accounted for approximately 2.9% of the deaths recorded in the country. The distribution by sex shows that males represented 58.6% of all deaths in this age group.

Ministry of Health information indicates that conditions such as anemia, gastroenteritis, infectious hepatitis, and typhoid fever have increased over the past years. The only disease that is reported for adolescents and adults is malaria, because the vector control service has a data collection system in place. It is estimated that 26% of the country's adult population smokes.

Health of Women

The General Registrar's Office registered 18,158 live births in 1988, of which 238 (1.3%) were among mothers 11–15 years old. That proportion was 1.2% of the

17,846 live births in 1989; and 1.3% of the 14,520 live births in 1990. Women aged 16–20 years old accounted for 28.8% of the live births in 1988, 27.6% in 1989, and 28.2% in 1990. The cumulative data reflect that approximately 29.5% of the births between 1988 and 1990 occurred among mothers aged 11–20 years old. Women aged 21–25 years old accounted for 34.1% of the live births in 1988, 34.6% in 1989, and 32.4% in 1990.

Live births among mothers aged 26–35 years old represented 31.1% in 1988, 31.8% in 1989, and 33.3% in 1990; whereas women aged 36–40 years old accounted for 3.7% in 1988, 3.7% in 1989, and 3.8% in 1990. Women 41 years old and older accounted for 0.6% in 1988, 0.7% in 1989, and 0.9% in 1990.

A contraceptive prevalence survey conducted in 1991–1992 revealed that 80% of teenage women in unions and 70% of women aged 20–24 years old in unions did not use a contraceptive method at the time of the survey, and suggested that the reason for this was lack of information, education, and service delivery programs.

The main causes for referrals for high risk pregnancies were anemia, hypertensive disease, past obstetric/gynecological history, medical conditions, and age. Of 9,060 pregnant women who had their hemoglobin levels checked and recorded at prenatal clinics in 1987, 70.5% had a level below 11 g/dl. In 1990, of 9,283 pregnant women, 76.4% were below that level. The increase probably reflected the economic reality of the majority of those who use the public health service.

The last official data on maternal mortality were published in 1984, when it was estimated at 180 per 100,000 live births. In 1990, Georgetown Public Hospital, located in the most populated region of the country, had a rate of 213.2 per 100,000 live births; at New Amsterdam Hospital, the largest hospital in the country's second most populated region, 340.4 per 100,000; and Suddie Hospital, the largest hospital in the fourth most populated of the country's 10 geopolitical regions, 442.5 per 100,000. It is felt that these high rates are the result of a lack of adequate technical facilities for safe deliveries, as well as the fact that there is no policy on abortion.

Women constitute approximately 21% of the country's labor force and, as a result of male emigration, many also have become heads of households. Even without available data, it may be posited that, given the generally lower educational level among women, this situation may lead to increased poverty and malnutrition.

Among women, the leading causes of admissions to the gynecological service of Georgetown Public Hospi-

tal in 1990–1992 were incomplete abortions, pelvic inflammatory disease, fibroid tumors, hyperemesis gravidarum, dysfunctional uterine bleeding, and cancer of the cervix.

Health of the Elderly

The most important causes of mortality and morbidity reported by the Health Statistics Unit in the age group 55 years old and older are chronic diseases such as cerebrovascular accidents, ischemic heart disease, and diabetes. Cataracts are common, and there are quite a few cases of glaucoma reported by the Georgetown Public Hospital's ophthalmology department. There is much physical disability that results from the country's limited physiotherapeutic facilities and the high incidence of cerebrovascular accidents among the elderly. Unfortunately, there is very little available data on the elderly.

Workers' Health

The Ministry of Health has not fully addressed workers' health. The details and the magnitude of this problem remain unknown because of data unavailability. The country's occupational health and safety profile and both the Ministry of Labor's and the National Insurance Scheme's annual reports show only data on injuries and deaths due to work-related accidents. A study on the exposure of agricultural workers to pesticides clearly demonstrated the occurrence of this health hazard. The study, however, stopped short of showing resulting health effects, because laboratory facilities were lacking. There have been several field investigations of hearing loss, contact dermatitis, and silicosis in the bauxite industry. Traces of monocrotophos, a highly toxic chemical, were found in vegetables exported to the United States in 1991.

Health of Special Groups

Amerindians, who have historically lived in the country's hinterland, usually live in small communities separated by mountain ranges and tropical rainforests. Clinics have been established in these areas and the primary health care system has been implemented. Among Amerindian children, malnutrition is the most important health problem; a high level of teenage pregnancy and poor maternal health also af-

fect the group. Health facilities in the areas inhabited by Amerindians have deteriorated or been nonexistent over the past years. Many Amerindian women seek employment as domestics in the country's capital and have also become involved in prostitution.

In 1993, there were no updated data about the situation of disabled persons. Data collected from six areas and available from the Georgetown Public Hospital's physiotherapy department revealed that in 1981 the incidence of disabilities was very high in two areas that are considered to be socioeconomically depressed. In Georgetown, where the country's only inpatient rehabilitation center for children exists, records show that the majority of disabled children come from families residing in urban slums or in the poorest areas of South Georgetown.

The delivery of rehabilitation services in Guyana was through specialized and centralized institutes or centers staffed by trained professionals and/or assistants. These are based in Georgetown, New Amsterdam (Region 6), Linden (Region 10), and Essequibo (Region 2). Community-based rehabilitation programs have been successfully introduced in several rural areas, as a way to provide rehabilitation services to disabled children in five rural areas. In Regions 4, 6, and 9, where programs have already been implemented, the main objectives of mobilizing community resources and providing greater coverage at lower costs already have been achieved.

Diseases and Health Impairments

Vector-borne Diseases

Malaria was the leading cause of morbidity reported in the country for 1986–1992. More than 60% of the cases are due to *Plasmodium falciparum*. The disease is not endemic in the highly populated area of the country where Georgetown, the country's capital, is located. The annual parasite index has shown an increasing trend, rising from 3.8 cases per 1,000 population in 1984 to 46.5 cases in 1988, 21.7 in 1989, 29.5 in 1990, 55.8 in 1991, and 52.3 in 1992. For the last 2 years, the indicator was calculated using revised available population data; considering that the population estimate for 1991 and 1992 was 1.6% less than that of 1990, the increased annual parasite rate was still significant.

Since 1985, when greater surveillance began as a result of increased gold and diamond mining activities in the endemic areas of the country, about five times

the number of blood smears have been examined annually—the percentage of positive slides neared 20% in 1986–1990 and increased to 29.7 and 24.9 in 1991 and 1992, respectively. *Plasmodium falciparum* accounts for approximately 60% of the cases (56.5% in 1991), and the main vector is *Anopheles darlingi*. Males account for approximately 70% of the cases annually (74.1 in 1991), reflecting the link of the disease with occupation in gold and diamond mining as well as timber exploiting activities. The most affected group for both males and females was that aged 19–28 years. The disease is endemic in five of the country's geopolitical regions: Region 1, which was the most affected area during 1988–1992, and Regions 2, 7, 8, and 9. Autochthonous and imported cases also have been detected in other regions.

Filariasis due to *Wuchereria bancrofti*, is endemic along the entire coast; the main vector is *Culex quinquefasciatus*. During 1991, smears were taken of 2,818 persons at the Georgetown Public Hospital's clinic; of those, 108 (3.8%) were positive. Of the 1,372 males examined, 73 (5.3%) were positive as were 35 (2.4%) of the 1,446 females examined. Among males, the most affected age group was 20–29 year olds, and among females, 10–19 year olds.

Regarding dengue, the *Aedes aegypti* control program only operates in the capital. The house index has been very high for a number of years. There is no ongoing surveillance for dengue cases, but cases have been detected as a result of individual physicians' request. Cases detected in 1992 have been of the dengue 1 serotype.

No cases of yellow fever have been reported since the 1970s.

In 1990, the first reported case of visceral leishmaniasis was detected in the country. In 1991, four more cases were serologically diagnosed from among persons who had visited the country's interior. There were seven cases of cutaneous leishmaniasis.

Vaccine-preventable Diseases

In 1988, there was a measles epidemic, with more than 900 cases detected. Since then, there have been less than 13 cases annually. In 1992, no cases were detected.

Since 1980 and 1981, when 80 and 99 cases, respectively, were reported, the number of reported cases of whooping cough has been small; no cases were reported in 1991 and 1992.

There have been no cases of tetanus reported since 1988.

No cases of diphtheria have been reported since 1980.

Cholera and Other Intestinal Infectious Diseases

During the first week of November 1992, the first cases of cholera were detected in Region 1, the northwestern region of the country that borders Venezuela. A total of 52 cases were reported during that week which included 13 hospitalizations and 2 deaths. Amerindians were the most affected group.

Between November 1992 and 2 January 1993, 556 cholera cases were reported in the country, of which there were 108 hospitalizations and 8 deaths.

Chronic Communicable Diseases

The country's program to control leprosy is a vertical program that operates dermatological services using normal health facilities. The only clinic in the country that is dedicated to treating the disease is located in the capital. The prevalence rate in 1981 was 0.6 cases per 100,000 population; by 1990, the prevalence rate had fallen to 0.11, to 0.06 in 1991, and to 0.05 cases in 1992. Most patients under treatment in 1992 were in the age group 15–44 years old, followed by the age group under 14 years old, the age group 45–64 years old, and those 65 years old and older. Approximately 36 new cases were detected annually between 1988 and 1992.

In 1990, the incidence of tuberculosis was approximately 20 cases per 100,000 population, dropping to 17.32 cases per 100,000 population in 1991. The mortality rate is approximately 2.5 per 100,000.

AIDS and Other Sexually Transmitted Diseases

Between 1987, when the first cases of AIDS were reported in the country, and 1992, 390 AIDS cases have been reported. The trend is for cases to increase for both males and females. During 1992, 160 new cases of AIDS were reported, representing an increase of 88.2% over 1991, when 85 cases were reported. Among males there was an 81.4% increase in the number of cases reported in 1992 over the 1991 figure, and among females, cases increased by 108.3% during the same period.

Heterosexuals represented 78.8% of the 160 cases reported in 1992, and in that year, the first case in an intravenous drug user was reported. A total of six children born to affected mothers have been diagnosed as

having AIDS, five of them in 1992. The most affected is the age group 25–29 years old.

HIV surveillance, carried out on an ad-hoc basis during 1992, showed that of 4,081 blood donors tested, 88 tested positive according to the ELISA test, but confirmatory tests using the IFA test established only 82 positive. Among 1,322 STD patients tested, 280 were positive by both the ELISA and IFA tests. Of the 302 individuals who had the test done as an Insurance or Visa requirement, 39 were positive according to both the ELISA and IFA tests.

Behavioral Disorders

According to cumulative data from Georgetown Public Hospital for 1987–1989, schizophrenia was the leading cause of admission among psychiatric patients, and represented about 32.0% of all cases. That was followed by conditions related to marijuana and/or cocaine use (11.6%), mental retardation of an unspecified degree (9.8%), personality disorders (9.2%), dual diagnoses (8.9%), acute psychotic reactions (8.0%), alcoholism (5.4%), neurosis (5.1%), major affective disorders (3.7%), epilepsy (3.6%), and dementia (2.3%). Male patients accounted for 57.1% of those admitted over the 3-year period.

The fact that conditions related to marijuana and cocaine use were the second leading cause of admission during the period highlights the illicit drug use problem and the fact that the country is not merely a transit point for illegal drugs. During the period there was an increase in the percentage of patients who, having been admitted to the observation wards, left without being discharged by a doctor, from 16.6% in 1987 to 25.5% in 1989.

Other Diseases

During 1987–1989, other leading causes of outpatient care reported from 8 of the country's 10 geopolitical regions were hypertension, respiratory infections, diabetes mellitus, diarrhea, worm infestations, arthritis, and anemia.

Risk Factors

Epidemics during the last 4 years were limited to gastroenteritis, diarrhea, and cholera which are known to be closely associated with poor environmental

health conditions. The main areas affected were: the hinterland, the mining camps, the coastal belt, and the marginal urban areas.

Risks in the Physical Environment

Although the quality at the source is generally acceptable, water intended for human consumption is bacteriologically poor. Contamination, which puts the health of the population at risk, occurs in the distribution system: about 169 of the 171 existing systems have no disinfection facilities. From 1988 to 1992, the reported incidence of waterborne diseases such as gastroenteritis, infectious hepatitis, and typhoid varied as follows: gastroenteritis, from 3,515 to 256 cases (465 to 35 per 100,000 population); infectious hepatitis, from 146 to 8 cases (19.3 to 1.08 per 100,000); and typhoid, from 119 to 17 cases (15.7 to 2.31). Cholera, detected in 1992, had, up to the end of that year, reached an incidence rate of 69 cases per 100,000 (526 cases).

Malaria has shown a high incidence rate, varying from 46.5 to 52.3 cases per 1,000 population between 1988 and 1992. No cases of other environment-related diseases such as filariasis and schistosomiasis or waterborne diseases such as amebiasis, salmonellosis, and shigellosis were reported during that period. The latest survey on filariasis was conducted in 1984, revealing a prevalence of *W. bancrofti* of 6.5% among the persons surveyed in the Georgetown area.

Air pollution is not considered as a serious risk factor. Certain toxic effects have been registered in Herstelling/Grove along the East Bank, following pesticide air-spraying; signs of intoxication also have been registered among the patients attending the local health facilities, who reported having eaten fruits from the area (no statistical data are currently available on these incidents).

The country's forests are tropical rainforests, mainly exploited for timber, gold, and diamonds. Malaria is known to be endemic in areas where these activities are carried out. For example, in Regions 7 and 8, the mid-western regions of the country, there were 494.9 cases per 1,000 population in 1992. Leishmaniasis has recently been reported in the savannah areas along the border with Brazil, but only a limited investigation was conducted. Schistosomiasis has not been officially reported, but the intermediate host, the *Biomphalaria glabrata* snail, has been identified in the Mahaica/Mahaicony/Abary agricultural scheme in West Berbice. The fact that schistosomiasis cases have

been detected in neighboring Suriname, and that there is frequent movement of persons between the two countries, could result in the introduction of the disease to Guyana.

Highly and moderately toxic chemicals are being used by the country's agricultural sector. The Ministry of Health's data of admissions to the main hospitals in Regions 2, 3, 4, 5, and 6, where agricultural activities are concentrated, revealed that between 1986 and 1990 intentional and involuntary poisoning occurred at a rate of 84 cases per 100,000 population living in those coastal regions. In 1989, traces of organochlorine pesticides were found in water samples taken from artesian wells, freshwater canals, and drainage canals in the agricultural fields of Mibicuri and Black Bush Polder in Berbice (Region 6).

Natural Disasters

Floods are a yearly occurrence in the country, causing important loss of livestock, cash crops, and property, and leading to drinking water contamination and the overflow of septic tanks and pit latrines. Usually, flooding results when sea defences are breached, allowing seawater to flood coastal low-lying areas, where 90% of the population is concentrated.

Housing

The country's housing situation is deficient, exacerbating the development of squatters' areas that have sprung up along the coast. In Georgetown, squatters' areas have developed along the embankment of the Lamaha canal which supplies raw water to the Shelter Belt water treatment plant. Some housing developments that also have emerged along the same canal do not have a proper sewerage system. Individual septic tanks and pit latrines are the current means of sewage disposal; however, they are not always sited at the allowable distance from the freshwater canal, thereby risking contamination of the canal water through seepage. Moreover, many squatters have no hygienic means of waste disposal.

Food Contamination

Despite existing Government regulations and food inspection programs, chemical contamination of food occurs due to the lack of control mechanisms. Since

1988, the food chemistry and food microbiology labs have not been operational due to a shortage of permanent qualified staff, chemical reagents, equipment, and adequate facilities. Outside of Georgetown, food protection and conservation facilities often are inadequate.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

General Political, Economic, and Social Policies

The political, economic, and social processes will be determined by the newly installed Government. The new party in power, the People's Progressive Party, won the 1992 elections with a platform stating that in terms of health, the present government would restore confidence in the health care system by reaching out to meet the needs of the country's rural, hinterland, and urban communities. The platform also stated that the Government's first task would be to involve those responsible for providing medical care directly in the field, so that they could see exactly what people needed. Efficiency is another priority, so that adequate quantities of drugs and equipment can be ensured. The new Government will provide improved services and facilities where people live and work, including more health services in heavily populated areas; an expansion of the available range of services; and better communication and transportation links between the different levels of care in the system. Community and private organizations will be encouraged and assisted to acquire funding for projects to improve access to the services.

Training priorities include maternal and child health, occupational health, mental health, and chronic diseases. Emphasis will be given to health maintenance and disease prevention and efforts also will include the promotion of an aggressive intersectoral campaign to improve nutrition, sanitation, and the supply of potable water in all the country's communities.

Although it is not considered strictly as a policy framework document, the 1993 budget stated that priority areas in the health sector include the rehabilitation and maintenance of health infrastructure, where the focus will be on regional and community health facilities, vehicle maintenance, and retention of qualified staff. Other priorities include improvement of pre-

ventive care through expanded immunization programs and provision of drug materials and medical equipment.

Health Policies and Strategies

There has been no single, clear-cut policy on drinking water, sanitation, and environmental health, and the National Environmental Policy (1990) is the only piece of legislation that has been officially approved by the Cabinet.

The transfer of control for water and sanitation and environmental health from the central Government to the regional authorities negatively affected the health sector. The quality and extent of water and sanitation services to the population have seriously deteriorated, because there were not enough qualified technicians or available labor in the regional system to properly operate and maintain them; in addition, spare parts frequently were unavailable. An overall decline also was observed in environmental health standards. The environmental health inspectorate in the regions has been reduced to 39 officers on duty out of an original 79; as a result, 4 out of 10 regions have no environmental health officers. New water wells were installed without improving the distribution system, so the water could not reach the population as intended. The situation was similar in the sewerage system in Georgetown, where new sewer mains were built without replacing the broken house connections. This resulted in frequent sewage overflow during rainy seasons.

Solid waste disposal systems were inconsistent, often becoming inoperative as soon as the mechanical equipment went out of order. Georgetown is currently the only town that has a functioning system, and even it is deficient.

The Ministry of Health's vector control service has overall responsibility for the control of vector-borne diseases in the country. It suffered a setback in 1991 and the incidence of malaria rose in 1992.

Occupational health and safety programs have mainly focused on workplace safety. The health of workers was not addressed. Apart from safety inspections, these programs provide curative rather than preventive care. The National Insurance Scheme and Guyana Sugar Corporation provide treatment to injured workers, but there is no program that provides periodic checkups. Only 1,200 out of 2,700 registered factories were visited by the Ministry of Labor's occu-

pational safety and health unit. More importantly, there is no record of remedial measures as a result of those inspections.

During 1981, a national rehabilitation and education committee was formed to coordinate the activities of the international year for disabled persons. The committee later became a permanent body for the implementation of the United Nations World Program for Action for the Decade of Disabled Persons, but the committee ceased to meet by the end of the 1980s and the secretariat is now reduced to one officer.

Organization of Services

Personal Health Care Services

The health system was decentralized in 1985, and responsibility for most health functions fell under the country's 10 regional administrations. The Ministry of Health has remained mostly as a quality-control unit, monitoring health conditions in the country and ensuring that equal care standards are provided in the different regions; it also tackles epidemics as they occur. The Ministry also has maintained responsibility for a few specific areas, including dental and preventive health.

The regional administrative committees operate independently of the Ministry, preparing their own budget proposals, determining staff requirements, and receiving operating funds directly from the central Government.

Several deficiencies in the decentralized system have led to a deterioration in the quality of health care. First, the regional administrations levied no taxes and received their funding directly from the central Government. In addition, the Ministry of Health's efforts to act as a quality-control body were hampered by the fact that the regional administrations were not accountable to the Ministry of Health. The situation remained the same in April 1993.

There are 115 health posts staffed by community health workers that operate at the grassroots level. There are 47 health centers which should be staffed by a health visitor, a medex (a paramedical person), and nurses. There are 16 district hospitals in 8 of the country's 10 regions.

The four regional hospitals in Regions 2, 3, 6, and 10 are designed to provide medical, surgical, obstetric, and pediatric care. There is one National Referral Hospital, the Georgetown Public Hospital. There are also

five private hospitals providing all services and one private pediatric hospital in the capital.

Preventive health care service and nutrition education are no longer offered at the national hospitals, and preventive dental care is very limited. Dentists in the regional hospitals, funded and equipped by the Ministry of Health and not by the regional administrations, lack basic equipment and materials, and function more as extractors of teeth than as dentists.

There is a government-funded home for the elderly, the blind, and the destitute and another for destitute and disabled children; similar shelters are run by churches and other nongovernmental organizations.

There is an outpatient psychiatric clinic and an observation ward for men and one for women at the Georgetown Public Hospital. There also is a National Psychiatric Hospital in Region 6.

In 1993, there were 244 physicians (0.33 per 1,000 population), 681 nurses (0.92 per 1,000), 1,005 nursing auxiliaries (1.36 per 1,000), 341 nurses' aides (0.46 per 1,000), 34 dentists (0.05 per 1,000), 22 pharmacists (0.03 per 1,000), and 3 social workers. In 1991, there were 94 doctors and 83 medex working in hospitals and health centers. Their distribution was uneven from region to region, with 67.0% of the doctors and 34.9% of the medex working in Region 4. The number of inhabitants for each doctor in the other regions ranged from 4,932 in Region 4 and 8,393 in Region 2, to 18,615, 19,298, and 27,778 in Regions 1, 10, and 5, respectively. There are no doctors in Region 8, which is under the responsibility of Region 7 doctors.

There is a public school of medicine, with a total teaching staff of 10, only three of them full time.

Environmental Services

Infrastructure. The environmental health services are extremely fragmented and have very little coordination with frequently overlapping functions and responsibilities. Some of those institutions are State entities, while others are fully or semi-autonomous.

The following fora allow the representatives of those institutions to meet and discuss specific environmental issues: the Advisory Environmental Council of the Guyana Agency for Health Sciences Education, Environmental and Food Policy; the Central Board of Health; the Food Safety Committee of Government Analyst/Food and Drug Department; the Occupational Health and Safety Council; the Pesticide Committee; and the National Monitoring Unit for Water and Sanitation.

The Linden Mining Corporation, the Guyana Sugar Corporation, and the Sugar Industry Labor Welfare Fund Committee are the only entities that are autonomous and self-sufficient; the others are either fully or partially dependent on the Government for funding.

Services. Water supply coverage is inadequate. Although data for 1992 show a 78.5% coverage nationwide, this coverage is inconsistent due to recurrent breakages, low water pressure, and frequent power outages in the system. Furthermore, the quality of the water is generally questionable. Simple disinfection of water is not generally practiced. Sporadic efforts have been developed to improve certain water supply schemes but few new connections were registered.

Coverage in sewage and excreta disposal has been estimated at 85%. There are two small rural sewerage systems, in Kwakwani and in Timehri, that discharge untreated sewage into the Berbice River and the Demerara River, respectively. In Georgetown, the sewerage systems of the Tucville housing development and the University of Guyana campus discharge their sewage in the nearby drainage canals, while the system serving the Georgetown center discharges untreated sewage into the mouth of the Demerara River. The rest of the country is served by septic tanks that discharge their effluent into the nearest drainage canal and/or by pit-latrines that easily flood during rainy season, particularly along the coastal areas.

During 1992, 500 pit latrines were built in Regions 4 and 5, and new sanitary facilities were provided to five schools in the community of Plaisance.

Generally, industrial and hospital wastes are disposed of haphazardly in open dumps or in the nearby drainage canals.

Food inspection, food quality control, and meat inspection were satisfactorily conducted. However, no water quality or chemical control programs were effectively implemented.

Health Promotion

Health education is the responsibility of the Guyana Agency for Health Sciences Education, Environment, and Food Policy. This agency works in close collaboration with the Ministry of Health and other agencies in locally preparing and publishing educational materials. The agency is involved in strengthening health action within schools through radio programs, fairs, and

exhibitions and in strengthening action-oriented health education through work with the Ministry of Education's curriculum reviews and development, as well as in the preparation of materials for use at different levels in schools. The agency assists in the development of an orientation towards primary health care and the strengthening of community-based action among health personnel in training.

Available Resources

The Social Impact Amelioration Program, whose mission, in collaboration with existing social service agencies, is to minimize the impact of the structural adjustment measures, receives special funds to support nutrition and health projects and labor intensive employment schemes in infrastructure rehabilitation.

HAITI

GENERAL HEALTH SITUATION AND TRENDS

Political, Economic, and Social Situation

The country's health situation is intimately tied to the economic and sociopolitical situation. Although the first democratic elections in 37 years were held in December 1990, the president-elect who took office in February 1991 was ousted by a military coup 7 months later. The international community refused to recognize the provisional government and suspended all assistance to the country. The Organization of American States decreed a trade embargo—exclusive of humanitarian aid—in November 1991.

The political crisis has been felt most severely in the area of employment. It is estimated that between September 1991 and February 1992, 143,000 jobs were lost in the private sector and that many businesses cut back on their working hours. Underemployment, which is widespread in Haiti, and frank unemployment, especially in the cities, together make for an effective unemployment rate of more than 50% of the active population. This situation weighs heavily on the family economy, since in Haitian society a single jobholder may support an extended family of more than 10 people.

By 1992, the per capita gross domestic product had fallen from a base level of 100 in 1980 to a low of 70 in terms of real prices. In 1990, the per capita gross national product was estimated at US\$ 370. The country's crisis has seriously affected education, and adult literacy is estimated at barely 53%.

Population

Haiti has a land area of 27,750 km² and a population density of 244 inhabitants per km². When population density is measured in terms of cultivated land area, the figure is considerably higher at 827 inhabitants per km², clearly showing the pressure the population exerts on available land.

In 1992, the country's total population was estimated at 6,764,000, and it is expected to reach 8 million by the year 2000. The annual growth rate is estimated at 2%, but it may actually be less, given the significant losses from rising mortality and the mounting levels of emigration.

The population's age distribution is typical of countries that have both high birth rates and high death rates—a large proportion is under the age of 15 (40%), while the age group 65 and over represents only 4% of the total population. At the same time, the intermediate age group progressively declines as a result of the stepped up emigration brought on by the sociopolitical crisis. Since October 1991, there has been a steep rise in emigration to other countries, and clandestine emigrants have been estimated at over 40,000. There also is a pronounced imbalance in the sex distribution of the population, because many more men than women leave the country. The economically active population between the ages of 15 and 64 represents 55% of the total population, and of this group, 25% are women of childbearing age. Life expectancy at birth is 55 years. The economic dependency ratio is 150 inactive persons for every 100 who are active, and there are only 96 males for every 100 females.

While overall urbanization is 30%, the figure varies considerably from one part of the country to another, and in recent years it has been on the rise. The urban population has been growing at a rate of 4% a year, whereas in rural areas the rate is only 1.3%. The urban population in Ouest Department, which was home to 57.8% of the urban population in 1992, has been increasing much faster than elsewhere. The Port-au-Prince metropolitan area continues to be the main pole of attraction for waves of migrants from the rest of the country. Most of these migrants are illiterate and unskilled, adding their numbers to the already swelling ranks of urban unemployed and causing shantytowns to proliferate along the city's outskirts.

The country has few sources of information, and routinely registered data are incomplete and unreliable. One of the main problems is a lack of vital statistics. Most of the reliable information is obtained through surveys.

Mortality

Information on the country's leading mortality indicators is based on United Nations estimates. The crude death rate for 1990–1995 is estimated at 13 per 1,000 population, while infant mortality is calculated at 94 per 1,000 live births. Of every 1,000 live-born infants, approximately 133 die in the first 5 years. Most of the deaths in children under the age of 5 are due to diarrheal diseases and acute respiratory infections.

In 1988–1989, general fertility was estimated at 5.8 per woman, and maternal mortality was 2.4 per 1,000 live births. The leading causes of maternal death are toxemia of pregnancy, hemorrhage, and infection during the puerperium.

There are no figures available on mortality associated with human rights violations. During the period immediately following the 1991 coup, Amnesty International cited a figure of 1,500 deaths. A March 1993 study issued by the United Nations Secretary-General reports information on disappeared persons and summary executions.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

According to United Nations estimates for 1990–1995, the crude birth rate is 36 per 1,000 inhabitants, infant mortality is 94 per 1,000 live births, and mortality in children under 5 is 133 per 1,000 children in that age group.

The average duration of breast-feeding in Haiti is 18 months, and 96% of all mothers had breast-fed the last child they had given birth to in the preceding 5 years.

Health of Adolescents and Adults

The health status of adolescents and adults is not as well documented as that of women and children. However, the partial data that are available indicate a predominance of infectious and parasitic diseases, cardiovascular diseases (especially those associated with hypertension), and sexually transmitted diseases, particularly HIV infection and AIDS, which are on the increase.

Health of Women

In addition to precarious living conditions and low income, sociocultural obstacles also affect the health status of women, especially women in disadvantaged environments.

The shortage of men contributes to the large number of female heads of household. Moreover, women have a fundamental role even when the father is present: the mother is responsible for organizing the household, raising the children and overseeing their education, and managing the family budget. Of the many tasks that fall to her, one that takes up a major share of her time, as well as that of the girls in the family, is the near constant search for water and fuel.

In terms of education, girls are at a disadvantage relative to boys; they complete 0.5 to 2.1 fewer years of primary schooling than boys.

The migration from rural to urban areas mostly involves women. Females begin to work at a very early age, and 10% of all girls as young as 5 to 9 years old are an integral part of the economically active population. Women accounted for 70% to 75% of the work force in the assembly plants installed in Haiti beginning in the 1970s, which are now largely shut down because of the political instability that has prevailed in the country since 1986 and, especially, the current political crisis and embargo. These women did not receive health care or other benefits called for by law.

In addition to the foregoing factors that work against women, there is a shortage of gynecological and obstetric services. Approximately 25% of all deliveries are associated with one of the following complications, in descending order of frequency: vaginal laceration, dystocia, hemorrhage, infection, or eclampsia. Moreover, 6% of all pregnant women report that they have had one or several induced abortions—probably a very low estimate, since abortion is illegal. The percentage is lower in rural areas (4.5%) than in the provincial cities (6.7%) or in Port-au-Prince (9.5%).

Health of Special Groups

Twelve years ago the Ministry of Social Affairs estimated the population of disabled persons at 800,000 and the number with a visual impairment at 80,000. There were 16,000 visually impaired children of school age, of whom only 69 were enrolled in regular schools. Ten institutions, including three general hospitals, provide special rehabilitation services. Some of these institutions offer various services for the disabled.

In June 1991 the Dominican Republic decided to expel 20,000 Haitians who had been working there without documentation. After the September 1991 coup, thousands of Haitians left the country for the United States of America and other neighboring countries. Only a small proportion of the survivors were able to obtain political asylum; the rest were sent back to Haiti. By November 1992 the International Federation of Red Cross and Red Crescent Societies had received some 31,000 repatriates, of which 2% were nursing infants, 9.5% were children under the age of 15, 80% were young adults between the ages of 15 and 36, and 8.5% were adults over the age of 36.

Diseases and Health Impairments

Vector-borne Diseases

In the absence of any national control measures since 1988 and without a clear environmental policy, malaria has become the second leading cause of reported morbidity and is a very serious public health problem. *Plasmodium falciparum* is the most prevalent agent, and *Aedes albimanus* is the main vector. Transmission usually occurs in the coastal area, where the population is heavily concentrated.

There are many obstacles to gathering information. According to the scant data available, 37,957 blood slides were examined in 1992, of which 13,457 were positive, for a slide positivity index of 35.5%. A total of 47 deaths were reported.

Despite the fact that the whole country is infested with *Aedes aegypti*, and that serotypes 1, 2, and 3 of the dengue virus have been identified, there is no program for combating the vector.

Lymphatic filariasis, found in scattered urban pockets in the north on the Gulf of Gonâve, continues to be a significant public health problem. Its effects are felt most severely among males because of the frequently associated elephantiasis of the scrotum. Acute lesions appear during infancy, while chronic lesions are seen during adolescence and often persist into adulthood. In most coastal cities, such as Léogâne, Petit Goâve, L'Arcahaie, and Limbé, at least 20% of the inhabitants are carriers of the microfilaria. In Léogâne and its environs the associated hydrocele is frequent in men over 15 years old and 5% of the people have elephantiasis of the foot.

No cases of yellow fever have been reported in more than 10 years.

Vaccine-preventable Diseases

The average attack rate for measles over the last 5 years was 24 per 100,000 population. However, given the inadequacy of the registration system, these figures are unlikely to represent the true incidence of the disease. An epidemic that broke out in July 1991 spread to all the country's departments. Children under 5 years old were the most affected. The attack rate during the first 6 months of 1992 topped 600 per 100,000 population.

Hepatitis B is moderately endemic in Haiti: 5.5% of all blood donors are positive for hepatitis B surface antigen. Hepatitis vaccination is not yet covered under the Expanded Program on Immunization.

A survey conducted in 1992 revealed that 80% of mothers who had given birth in the 6 months before the interview had protective antibody titers against tetanus.

There is no available information for 1991–1992 about diphtheria or whooping cough. No cases of poliomyelitis were reported in 1992.

Cholera and Other Intestinal Infectious Diseases

Every child in Haiti suffers an average of seven episodes of diarrhea per year. However, data for 1987–1990 from the Ministry of Public Health and Population indicate that oral rehydration therapy is little used. The number of diarrhea cases examined during 1992 in 39 sentinel institutions has remained relatively constant, with higher levels in June and July in Port-au-Prince and Nord Department, coinciding with the rainy season.

Typhoid fever is endemic in the country. In 1991, an epidemic broke out in marginal areas on the outskirts of the capital. Several epidemic foci were reported in 1992, most notably in Sud Department. No cases of cholera have been reported.

Chronic Communicable Diseases

The annual incidence of tuberculosis is estimated at 500 cases per 100,000 population. In 1992, a total of 6,954 cases were diagnosed and treated, but this number represented only 23% of the total cases in Haiti. The occurrence of tuberculosis in association with AIDS has severely affected the country's overall health situation. On top of this problem, the cure rate is low (about 40%) and with no effective campaign to promote immunization with BCG, this activity has been steadily declining since 1990.

Only partial data are available on leprosy. Between 1977 and 1992, a total of 1,706 cases were registered at the country's two reference centers: La Providence de Gonaïves Hospital and the Fame Pereo Institute in Port-au-Prince. Of the cases registered, 82.3% were paucibacillary and 30% of these were in children under the age of 15. Of the 26 multibacillary cases, only 1 was in a child under 15. In 1992, 124 new cases were detected, 21% of which were multibacillary. Of the new cases identified in Port-au-Prince, 10% involved type II or type III disabilities.

Acute Respiratory Infections

Acute respiratory infections account for 30% to 60% of all pediatric consultations and 30% to 40% of all hospitalizations. In 1992, pneumonia was the principal cause of death among the acute respiratory infections. When it is not the primary cause for admission, it often occurs as a complication of measles, and it is also associated with malnutrition and diarrhea. In-hospital case-fatality rates range between 10% and 15%. The reported incidence of pneumonia in children under the age of 5 is 2%, although this figure may be underestimated.

Rabies

Two cases of human rabies were consistently reported each year beginning in 1970 and through 1990. No cases were reported in 1991, and three cases were reported in 1992. Animals are almost never vaccinated.

AIDS and Other Sexually Transmitted Diseases

In the population at low risk for syphilis in the metropolitan urban area, the rate of seropositivity was 3% to 6% in 1990 and 6% to 8% in 1991. In 1992, seropositivity in a group of pregnant women in four sentinel localities (Mirebalais, Cayes, Port-de-Paix, and Jérémie) ranged between 4% and 12%. In the high-risk population, on the other hand, the rate was between 30% and 40% in 1990. Syphilis is the primary cause of genital ulcers in Haiti. It is also frequently associated with soft chancre, invasive genital herpes (especially in association with AIDS), granuloma inguinale, and venereal lymphogranuloma, in that order. Gonococcal infections were the primary cause of urethritis in men in the metropolitan population.

In 1990, a total of 3,086 AIDS cases were reported, of which 40% were in women. HIV screening revealed that in high-risk groups, such as prostitutes, positivity had increased from 61% in 1987 to 72% in 1990. Twenty-eight percent of the men and 14% of the women with sexually transmitted diseases are HIV-positive. Among adults suffering from tuberculosis, 24% were HIV-positive in 1991. In 1992 a seroprevalence survey conducted by Grace Children's Hospital in selected groups attended at that institution showed that 14.5% of the children hospitalized with tuberculosis were HIV-positive, as were 13% of those receiving outpatient treatment and 1.5% of those hospitalized in the general pediatric service. This survey confirmed the close link between tuberculosis and HIV infection.

In 1992, 6% of blood donors between the ages of 14 and 19 and 7% of those aged 20 to 24 were HIV-positive. In certain social and occupational groups in urban areas (for example, itinerant workers in the telephone and power companies, hotel and bar employees) HIV positivity ranged from 6% to 9% in 1991. In 1992, the rate was between 3% and 5% in semirural areas and between 2% and 4% in rural areas.

Sentinel studies conducted in 1992 and 1993 by the Haitian Children's Institute in four provincial localities (Mirebalais, Cayes, Port-de-Paix, and Jérémie) showed HIV positivity ranging between 5% and 8% in pregnant women.

Migration from the cities to rural areas (especially semiurban areas where HIV positivity is high), has had a marked influence on the course of sexually transmitted diseases and AIDS. Contact with the rural population has contributed to the spread of HIV infection, and the situation worsened following the withdrawal of organizations that were providing technical and financial assistance for activities aimed at preventing these diseases.

Nutritional and Metabolic Disorders and Deficiencies

The nutritional status of children under the age of 5 has been documented in various surveys. In 1990, two surveys revealed a high prevalence of acute malnutrition, which was greatest in the northern region of the country. Calculated on the basis of weight-for-height, acute malnutrition was found to be 6.3% in the five departments most affected by drought (Nord, Nord-Est, Nord-Ouest, Centre, and Artibonite) and 3.5% in the other four departments. The survey also revealed a very high prevalence of chronic malnutri-

tion, which was about the same in all areas of the country. Based on height-for-age, the rate of chronic malnutrition was 34.9% in the northern region and 33.5% in the south—in other words, it affected one-third of all the children. Retarded growth in the first 6 months of life was not a frequent observation, but after the age of 6 months, nutritional deficiencies became more pronounced.

Data gathered for 1991 and 1992 at 35 sentinel centers located throughout the country show that 50% of all preschoolers suffered from some degree of malnutrition; the figures were about the same for each of the 2 years. The situation varies in different parts of the country: in 1992, more than 30% of the preschool-age children attended by the health establishments of Nord-Ouest Department suffered from serious malnutrition. A survey conducted on the Island of Gonâve in August 1992 showed that 5.6% of the children under 5 suffered from acute malnutrition, and 24.2% of them had chronic malnutrition.

In 1991, the prevalence of visible goiter in the central plateau was 4.3%, while the national rate of goiter was 9.7%. There are no programs for the iodination of salt.

With regard to vitamin A deficiency, in 1991 the prevalence of xerophthalmia in children under 6 years of age was 1 per 1,000.

The rate of anemia is 36% in nonpregnant women, 35% in nursing women, and 39% in pregnant women.

The only information available on diabetes, which is from 1987, underlines this disease's importance: more than 10% of the deaths in the internal medicine service at the State University Hospital are associated with this disease, and 50% of all amputations are performed on diabetic patients.

Chronic and degenerative diseases, accidents, and mental disorders are poorly documented at the national level.

Cardiovascular Diseases

Although national data are insufficient to precisely evaluate the impact of these diseases, they, especially arterial hypertension, are definitely recognized as public health problems. It is estimated that 70% of the cases of cardiovascular disease among patients in private services and the State University Hospital are associated with hypertension, and 13% to 15% of the population over the age of 18 in the greater metropolitan area suffers from this condition.

The care of patients with cardiovascular disease, especially those suffering from hypertension, is ham-

pered by two main problems: delayed detection and high rates of patients who abandon treatment, with no more than 25% following the therapeutic regimen after 3 months.

Malignant Neoplasms

According to data from the pathology unit at the State University Hospital, the most frequent cancers, in descending order, are cancers of the ovaries, breast, uterine cervix, prostate, penis, rectum, and stomach.

The treatment of neoplasms is limited to surgery to remove them or clean up the site. Chemotherapy is unavailable. The only radiation therapy service, to the National Oncology Institute, has outdated equipment and fails to meet the needs of the population.

Behavioral Disorders

Cases of mental disorders have increased in recent years in connection with drug consumption (marijuana, cocaine, and crack), political violence, and social unrest. Between 1991 and 1992, admissions to the Kline-Mars Psychiatric Center increased from 297 to 530.

Oral Health

There is no national oral health program. Caries in children 6 to 7 years old are of the fissure type only. Two-thirds of the adults examined have had one or more teeth extracted, and 90% of them have one or several teeth with caries.

Risk Factors

Risks in the Physical Environment

The poor drinking water and basic sanitation situation has set the stage for a high prevalence of diseases transmitted by water and feces, such as diarrhea and typhoid fever. Deforestation has led to changes in the rainfall pattern, one of the most notable consequences of which is a drastic reduction in the volume of water flow from the usual sources. Some of the sources that provide drinking water for the capital city have lost more than 50% of their volume in the past 5 years.

Natural Disasters

Haiti lies in an area prone to earthquakes and hurricanes, but it has been relatively free of the latter since Hurricane Gilbert. However, drought and consequent famine have plagued Nord-Est Department and the Island of Gonâve for several years; the problem was especially severe in 1991.

Food Contamination

There is no effective control of food for human consumption. Street vendors are widespread, as are all the problems brought on by the absence of hygienic controls over food handling.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Health Policies and Strategies

The country's current health situation is the end result of a policy that has fostered inequality. Moreover, there are enormous differences between the laws on the books and actual policy.

The juridical basis for the national health system is contained in a decree dated 28 November 1983 that reorganized what was then the Department of Public Health and Population, creating a ministry of the same name. According to this decree, the Ministry's mission is to develop, define, crystallize, and evaluate the health and population policy of the Executive Branch through the promotion, protection, restoration, and rehabilitation of individual and collective health.

The programs that have been accorded the highest priority are the National Program for Diarrheal Disease Control and Promotion of Breast-feeding, the Expanded Program on Immunization, the Tuberculosis Control Program (subsequently merged with the leprosy program), the Campaign against Vector-borne Diseases, the Maternal Health and Family Planning Program, the Nutritional Improvement Program, and the National Campaign against AIDS. In 1989, all these priority programs were grouped together under a single priority program coordination unit, supported by an epidemiology section.

The deterioration of political, social, and economic conditions has severely hindered malaria control. With humanitarian aid support and with the participation of nongovernmental organizations, steps are being

taken to incorporate malaria control into primary health care, as a way to reduce this disease's incidence and prevalence.

Generally, the present oral health situation is characterized by a shortage of personnel and resources, which are especially critical to the provinces and rural areas, where current care is essentially limited to tooth extractions.

In April 1991, the Ministry of Public Health and Population was restructured, and this process involved an almost total shutdown of administrative services for 2 months (July to September), during which only the Expanded Program on Immunization, the diarrheal disease control program (on the alert against a possible epidemic of cholera), and the Division of Public Hygiene were in partial operation. There is no explicit population policy, although internationally funded activities are being carried out in this sector.

Organization of Services

Health System

The health system encompasses four sectors—public, private not-for-profit, private for-profit, and traditional medicine—although in practice the lines between them are not always clearly drawn.

The public health system reaches only a small segment of the population. The Institute of Social Welfare and Research, under the Ministry of Social Affairs, is responsible for handling sexually transmitted diseases in prostitutes, providing prenatal consultations, caring for street children, and also assigning physicians to the orphanages under its jurisdiction.

The social security system, which receives support from the Ministry of Social Affairs, is very limited in scope. It provides coverage to 42,819 beneficiaries (1991–1992), who in theory are checked once a year for tuberculosis and syphilis. It has a 50-bed hospital in Port-au-Prince, used mainly for the treatment of persons injured in the workplace.

Only a few urban workers have insurance coverage for illness, maternity, and workplace accidents, and the services are limited and poor in quality.

Seven public sector nursing homes, located in six different departments, provide care for the elderly; the crisis has affected these institutions.

The nonprofit private sector includes various nongovernmental organizations that currently administer some 30 local health systems (some of which have no access to hospital services), covering approximately

1.5 million inhabitants. However, the nongovernmental organizations and the private sector often function independently and do not coordinate their activities with the rest of the health services. This situation is largely due to communication difficulties (impassable roads and lack of telephones or radio receivers) and reluctance to be under the direction of a public sector that has yet to demonstrate its managerial capability.

The for-profit private sector is composed of physicians and specialists who practice in private clinics that are located mainly in Port-au-Prince and other large cities. The high cost of the services offered by these institutions makes them virtually inaccessible to most of the population. At the same time, it should be noted that almost all the physicians in the private sector are on the payroll of the Ministry of Public Health and Population.

Because of their lower cost and greater accessibility, the services of traditional practitioners (healers, midwives, etc.) are widely used by the population.

Infrastructure. Of the country's 562 health institutions, 233 (40%) are in the public sector, 167 (30%) are mixed (with the public sector paying most of the salaries but the private sector assuming responsibility for their management), 118 (20%) are in the private sector, and 44 (10%) are unidentified as to sector.

The bed ratio per 1,000 population is unevenly distributed in the country: the eastern region has 1.21 beds per 1,000 population, which is considerably higher than the national average of 0.77 per 1,000, while Grand'Anse and Sud-Est Department, with 0.35 and 0.33 beds per 1,000 population, respectively, are the least favored areas.

Coverage. It is estimated that half of the population has no access to primary care. There are approximately 1.6 physicians and 1.27 nurses for every 10,000 inhabitants.

Maternal and Child Health

Among women who delivered a live-born child in the 5 years prior to the 1989 Haitian national contraception survey, the proportion that received prenatal care during the most recent pregnancy was 83% to 86% in the urban areas and 61% in the rural areas. Nearly half of women who received health care had more than three prenatal consultations. Half of the women gave birth to their most recent child at home, and 70% of the women living in Port-au-Prince had their deliveries in

a hospital. In urban areas, 44% of the deliveries took place in hospitals, whereas in rural areas the figure was only 11%. It is estimated that two out of every three women were attended by a midwife during delivery. Postnatal care is still incipient, and there is almost no reliable information on the subject.

When the 1991 national contraception survey was conducted, only 7% of the women and 9% of the men were using some form of birth control.

Immunization. Despite a sizable increase in vaccination coverage in 1988 (albeit still short of satisfactory levels), the numbers declined sharply in 1989–1992: for DPT the rate fell from 50% in 1989 to 23% in 1992; for poliomyelitis it went from 50% to 25%; for measles it decreased by half in 1989 (31.2%) and continued to fall to 22% in 1992; and for BCG, after a notable increase in 1989, it plummeted from 72% to 23% in 1992.

Food-aid Programs

Malnutrition, an extremely serious public health problem, is a consequence of both quantitative and qualitative deficiencies in the national diet. The population groups most affected are children under the age of 5, pregnant women, and the elderly. Humanitarian aid, that was carried out throughout the embargo, made it possible to guarantee direct distribution of essential foods from November 1991 on. This food aid continued throughout 1992, with emergency programs sponsored by various donors (the European Union, France, Canada, and the United States of America). Together, the programs established since October 1991 have benefited nearly 2 million people, including refugees.

There are three different kinds of interventions: food aid in general, which focuses on distribution in public dining rooms and school lunchrooms; supplementary feeding, administered in nutrition centers that are studying and diagnosing cases of malnutrition, usually among vulnerable groups (pregnant women or nursing infants); and therapeutic feeding for children with severe deficiencies.

Funds granted for food aid in 1992 totaled about US\$ 54 million.

Environmental Services

Investments in the drinking water supply and sanitation sector during the 1981–1990 decade averaged

US\$ 14 million per year; then, in 1991, there was a slight upsurge, with that same amount being invested during the first 9 months of the year alone. However, when external assistance was suspended, most of the construction then under way came to a halt before the projects could be placed in service, and these works have since gone to rust. Moreover, maintenance of installed systems has been virtually suspended.

The international community's humanitarian aid programs reached only 18% of its normal spending levels, and focused only on repairing existing installations and controlling drinking water quality.

Drinking water and sanitation coverage levels remained unchanged. In December 1992, 53% of the population in the capital city, 58% in 72 other urban areas, and 33% of the rural population had access to drinking water services. Basic sanitation coverage reached 43% of the urban population and 15% of the rural.

Emergency aid to the sector was revived at the end of March 1993, and current projects represent an investment of US\$ 7,355,000. Only 30% of the solid waste generated daily in the capital is regularly collected.

Health Promotion and Community Health

The level of health education is very low, and public information, education, and communication activities have been at a virtual standstill since 1991. Community health programs are essentially carried out by nongovernmental organizations; these initiatives, supported by humanitarian aid, have made it possible to get activities going again in various institutions—though without promoting community participation.

Available Resources

Human Resources

Health workers are usually trained in institutions under the jurisdiction of the Ministry of Public Health and Population. In 1993, there were six such institutions: the University of Medicine and Pharmacy, the University of Odontology, three public schools of nursing, and the School of Medical Technology. In addition, there is the Haitian Institute for Community Health, a private, nonprofit institution that offers training in community health. The private sector also has numerous establishments that provide medical and paramedical instruction.

In 1992, the Ministry had 8,900 employees, of whom 38% were medical and paramedical personnel and 62% were administrative and support staff; together they represented 19% of all civil servants. In 1989, 70% of the physicians, 60% of the nurses, 50% of the dentists, 26% of the auxiliaries, and 50% of the general administrative personnel were working in Port-au-Prince. Department-level hospitals had personnel shortages in gynecology, obstetrics, pediatrics, surgery, and orthopedics. In addition to the foregoing personnel, there are traditional midwives, who attend almost 70% of the country's births.

The number of physicians dropped from 887 in 1989 to 564 in 1992, while nurses increased from 691 to 728.

Financial Resources

In 1992, expenditures of the Ministry of Public Health and Population amounted to 11% of all government spending. Devaluation of the gourde relative to the U.S. dollar, coupled with the growth in population, had the effect of lowering the per capita public sector expenditure on health—from US\$ 3.60 in 1989 to US\$ 2.90 in 1992. Unfortunately, investments in health achieved little during 1989–1992, because salaries accounted for more than 90% of total disbursements, and, as a result, institutions could not even cover their basic, essential costs. Funds for the execution of priority programs, investments, and other development costs of the Ministry of Public Health and Population came almost exclusively from foreign aid. Table 1 shows the breakdown of health spending by sources. External cooperation in the area of health represents approximately 12% of all external cooperation received by the country (US\$ 150 million).

There are no available data on health expenditures by individual households or by nongovernmental organizations in recent years in this area; nor are there data on employers' contribution to health insurance. Private health insurance programs lost many of their subscribers when jobs were cut back as a result of the coup and the embargo.

Haiti receives humanitarian aid from various international organizations and bilateral agencies, including UNDP, the European Union, UNICEF, USAID, PAHO/WHO, UNFPA, the Canadian International Development Agency (CIDA), and the governments of Switzerland and the Netherlands.

TABLE 1
Expenditures on health, Haiti, 1989–1992.

| Type of expenditure ^a | 1989 | 1990 | 1991 | 1992 |
|--|-------------|-------------|-------------|-------------|
| Ministry of Public Health and Population budget | 22.3 | 19.4 | 19.5 | 19.5 |
| Bilateral external cooperation | 8.3 | 15.7 | 10.5 | 11.4 |
| Multilateral cooperation | 6.8 | 7.3 | 5.3 | 7.2 |
| Total | 37.4 | 42.1 | 35.4 | 38.1 |
| % of GDP | 2.1 | 2.6 | 1.9 | ... |
| Per capita ^b | 6.1 | 6.8 | 5.5 | 5.6 |

^aIn millions of U.S. dollars.

^bIn U.S. dollars.

Physical Resources and Equipment

Health Technology. The country's health technology continues to be scanty. Clinical analysis laboratories are found in the cities and in some of the private or mixed hospitals in rural areas, but they only perform basic tests. A total of 122 public institutions offer diagnostic services for malaria and/or tuberculosis.

The State has no system for controlling the quality of analytical tests or drugs, nor does it have official standards for their preservation and handling. Consequently, drugs often are sold under less than desirable preservation conditions.

Radiology and radiation therapy services are located mainly in Port-au-Prince and in a few department-level hospitals in rural areas. They are not controlled in any way, and no maintenance is performed. The equipment is outdated, the technicians are not

well trained, doses are not properly metered, and the protection provided in X-ray rooms is undependable. Since 1986, the Blood Transfusion Center of the Haitian Red Cross has been responsible for blood transfusions throughout the national territory. There are blood transfusion centers in the major cities and in some of the district hospitals. HIV screening is done at all the transfusion centers, and PAHO/WHO provided technology for performing the ELISA test.

In addition to HIV screening, tests are done for hepatitis B surface antigen and syphilis. Even with funding, in 1992 there was an interruption in supplies for the hepatitis B tests. The Haitian Red Cross Blood Transfusion Center does not have its own sources of funding; it is entirely dependent on international humanitarian aid.

Drugs. There is no national policy on drugs. Two laboratories produce basic drugs in the form of pills and syrups, and rehydration salts have been manufactured since 1981 (after an interruption, production has resumed). A central supply clearinghouse called PROMESS (Essential Drugs Program) has been created to address these deficiencies and to guarantee a steady supply of essential drugs and medical inputs for the disadvantaged populations. It also arbitrates the pricing of drugs on the commercial market in Haiti. PROMESS provides a total of about 270 drugs, including the essential drugs on the WHO Model List, as well as a broad range of related products: treatment supplies, laboratory products, radiology supplies, syringes, thread for sutures, etc. In May 1993, PROMESS served more than 300 health institutions.

HONDURAS

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

Since 1980, Honduras has had an extremely unfavorable balance of payments. The fiscal deficit in 1989 amounted to 9.2% of the gross domestic product (GDP) and was financed through internal and external credit. The country's foreign debt rose to US\$ 3,322 million. The situation was sustainable only because of the geopolitical position of Honduras in relation to the Central American conflict, which permitted the influx of resources and the endorsement of the financial policy by international lending agencies.

Although some structural adjustment measures had been introduced during the 1980s, efforts in this regard gained momentum only with the enactment of the Law on Structural Reform (Decree 18-90 of March 1990). It provided the legal framework for the expansion and accelerated implementation of new economic policies.

The agricultural sector is the principal base of support and production for the development of Honduras. In 1983 this sector generated 29% of the GDP and employed 55% of the economically active population. Coffee, bananas, and tobacco accounted for 76% of the country's exports in 1992.

Some new employment has been created in the processing and assembly industry, but it has not been sufficient to offset the unemployment caused by structural adjustment, which is estimated to have left more than 100,000 workers unemployed between 1990 and 1992. By the end of 1992, unemployment (both open and hidden) had risen to 40% of the economically active population.

In 1980, 68% of the population was living in poverty, and 57% of that segment in extreme poverty. By 1985 the proportion living in poverty had increased to 79% for the country overall. The proportion living in poverty in urban areas increased from 44% to 61% between 1980 and 1985; in rural areas, it rose from 80% to 90%. Extreme poverty, however, remained at the same

level of 57% for the country as a whole, with figures of 32% for urban areas and 72% for rural areas.

Overall, the proportion of poor people remained fairly constant from 1985 to 1988, when it was 78%, as did the proportion of those living in extreme poverty (55%). For the latter year, separate figures are available for the country's two major cities, Tegucigalpa and San Pedro Sula, where 58% of the population was reportedly living in poverty, as compared to 57% in other urban areas. The figures for extreme poverty were 32% in Tegucigalpa and San Pedro Sula and 27% in other urban areas. In rural areas the proportion of the population living in poverty in 1988 was 89%, which includes 70% living in extreme poverty. These figures show that living conditions, as measured by unmet basic needs, improved somewhat in urban areas during the period 1985-1988, but remained essentially unchanged in rural areas.

Up to 1988 poverty was measured on the basis of unmet basic needs, but since that year it has been calculated on the basis of the cost of the basic food basket and the prices set by the Central Bank. With this methodology, estimates of the extent of poverty are slightly lower, but the urban-rural differentials remain. For example, in 1988 these calculations yielded an estimate of 68.5% of the total population living below the poverty line; this proportion increased to 73.2% in 1991. Between 1988 and 1991 the proportion rose from 74.3% to 75.4% in rural areas and from 65.5% to 70.3% in urban areas. A breakdown of the urban figures reveals that in Tegucigalpa the proportion rose from 52.5% to 67.3% and in San Pedro Sula it increased from 52.4% to 63.3%, while in other urban areas it went up from 65.5% to 74.8%.

These differences are manifested in the distribution of basic services. In 1991, 39.8% of dwellings in rural areas were connected to water supply systems, whereas the figure in urban areas was 82.1%. There is also a marked rural-urban disparity with regard to excreta disposal systems: in rural areas only 5.7% of the dwellings have sewerage connections, as compared to 62.6% in Tegucigalpa and San Pedro Sula and 39.5% in other urban areas. In 1991, 47% of the homes in the country had electricity. In Tegucigalpa and San

Pedro Sula, the proportion was 93.6%; in other urban areas, 79.1%; and in rural areas, 16%.

The health situation in the country is conditioned by the living conditions described above for urban and rural populations, a relationship which is made apparent by several indicators. Infant mortality is 1.6 times higher in rural areas than in urban areas (59 and 36 per 1,000 live births, respectively, in 1991–1992). Between 1980 and 1991–1992, infant mortality declined 28% for the country as a whole, dropping from around 70 to 50 per 1,000 live births. In Tegucigalpa and San Pedro Sula it decreased from 51 to 38 per 1,000 live births (25%); the decline was even greater in other urban areas, where it fell from 60 to 36 per 1,000 live births (40%). In rural areas, however, the decline was smaller—from 76 to 59 per 1,000 (22%).

There are also significant differences between urban and rural areas with regard to severe growth retardation among children 6–8 years old. In 1991, 12.0% of all the children in this age group who were attending primary school showed growth retardation; the prevalence in rural areas was 14.9%, while it was only 6.9% in urban areas. Nevertheless, it is worth noting that the urban-rural gap with regard to adequate per capita caloric intake, as determined by height-for-age, has narrowed in the past decade; in 1978–1980, for example, the percentage with adequate intake was 95% in urban areas and 83% in rural areas, but by 1991 these figures were estimated at 98% for urban areas and 92% for rural areas.

The urban-rural differences are also apparent in figures on prenatal care in public-sector institutions. In 1987 the proportion of women who received at least one prenatal check-up was 79% in Tegucigalpa and San Pedro Sula and 71.3% in other urban areas, but 59.9% in rural areas. By 1991–1992 the proportion of women receiving some prenatal care had increased to 72.6% for the country as a whole; it remained about the same (79.8%) in Tegucigalpa and San Pedro Sula and increased to 81% in other urban areas and to 67.1% in rural areas.

According to data for 1989, health conditions are closely related to water supply. Infant mortality was 29 per 1,000 live births among families living in dwellings connected to a water supply system, 44 per 1,000 among families who did not have house connections but had easy access to water, and 63 per 1,000 among those who relied on another source of water, such as a well or river. The prevalence of severe growth retardation among schoolchildren aged 6–8 years showed the same association with water supply: it was 7.7% among children whose homes had house connections,

12% among those in homes with easy access to water outside the houses, and 17% if the family obtained water from another source.

Population

The latest national census, conducted in 1988, estimated the population at 4.5 million, with a population density of 23.5 inhabitants per km². There are two major population centers—the city of San Pedro Sula, in the north, with 270,000 inhabitants, and the capital, Tegucigalpa, located in the south-central part of the country, with 590,000 inhabitants. The population of Tegucigalpa increased by 97% during the period between censuses (1974–1988) and that of San Pedro Sula grew 79.3%. In 1988, 20.7% of the country's total population resided in these two cities. The rest of the urban population is distributed in 188 towns and cities with populations ranging from 2,000 to 100,000. In 1988, 41.7% of the total population was urban, as compared to 31.4% in 1974. The rural population, which numbers approximately 2.55 million people and constitutes 58.3% of the total population, is distributed in 25,413 small communities of fewer than 2,000 inhabitants each.

In 1988, 46% of the population was under 15 years of age (41.9% in urban areas and 50.1% in rural areas). The proportion of persons aged 65 years and over was 3.4%. The dependency ratio was 91:100.

The statistics in the 1988 census on net international migration showed a somewhat negative balance (–1.4 per 1,000 population). Internal migration during the 1974–1988 intercensus period was estimated at 20%. The areas attracting the greatest influx of migrants were the departments of Cortés and Francisco Morazán, where the cities of San Pedro Sula and Tegucigalpa are located. These two departments experienced increases of 70.6% and 77.3%, respectively, during the period between censuses. This growth has made it difficult to maintain drinking water supply and sanitation coverage levels. In 1974, 90.5% of urban inhabitants had easy access to water, either on their property or within 200 m; in 1991 the proportion was estimated at 89.3%. Between 1974 and 1991 drinking water coverage in rural areas increased from 21.2% to 51.4%. With regard to sanitation, during the same period coverage increased from 78.8% to 90.1% in urban areas and from 10.6% to 43.1 in rural areas. (Sanitation coverage is considered to include access to a toilet, a water-flush latrine, or a simple latrine inside or adjacent to the home.) Between 1987 and 1992 the propor-

tion of urban dwellings with toilets decreased from 61.6% to 50.4%.

According to information from the 1988 census, the total fertility rate was 5.36 children per woman in 1987. National surveys have shown a modest reduction in fertility, from 5.6 to 5.22, between 1987 and 1991–1992. The birth rate remained at 36.0 per 1,000 population. The total fertility rate in 1991–1992 was 3.44 children per woman for Tegucigalpa and San Pedro Sula, 4.25 for other urban areas, and 6.39 for rural areas. During the period 1988–1990 the total fertility rate among women with no formal education was calculated at 6.97; it was 6.23 for women with 1–3 years of schooling, 4.93 for women with 4–6 years, and 3.06 for women with 7 or more years.

The crude death rate was estimated at 13.62 per 1,000 population during the period 1970–1975 and at 6.4 for 1993. Life expectancy at birth increased from 54 to 67 years during the same period, and for 1993 it was estimated at 65 for men and 69 for women. Between 1970 and 1990 infant mortality decreased from 108.7 to 50 per 1,000 live births.

Mortality

Mortality figures suffer from substantial underregistration, not just because deaths are not reported but because the information gathered by local offices of the National Registry is not relayed to the General Bureau of Statistics and Censuses, which processes the data at the national level. In 1983 only 19,304 deaths were registered out of the total of 37,000 estimated to have occurred that year, which indicates 48.8% underregistration. For 1987 underregistration increased to 60.4%, with only 15,033 of the estimated 38,000 deaths registered. However, in 1990, the last year for which figures are available, underregistration decreased to 44.5%, with 17,350 deaths registered out of the estimated total of 39,000.

Mortality has clearly declined among all age groups, but the reduction has been most evident among children under 5 years of age. Infant mortality decreased from 72.6 to 50 per 1,000 live births during the period 1980–1990, and mortality among children aged 1–4 dropped from 7.3 per 1,000 during the 5-year period 1980–1984 to 6.4 per 1,000 during 1985–1989.

In 1983 some 48% of the registered deaths were assigned to the category “signs, symptoms, and ill-defined conditions” (ICD-9, 780–799). In 1987 the proportion assigned to this category decreased to 27%, and in 1990 it dropped to 22.5% (20.7% of the male deaths and

24.9% of the female deaths). Because the population is so scattered in some areas, it is estimated that at least 30% of deaths are reported by volunteer informants in local communities, which makes it even more difficult to ensure accurate diagnosis of the cause of death.

Beginning in the period 1965–1969 a significant decline in mortality from communicable diseases was noted in all age groups. Between the periods 1965–1969 and 1980–1984 the rate decreased from 63.1 to 46.6 per 1,000 live births among children under 1 year, from 14.9 to 5.3 per 1,000 population in the age group 1–4, and from 13.9 to 9.0 per 1,000 in the age group 65 and over. In 1990 communicable diseases accounted for 18.4% of deaths from defined causes among males and 22.2% among females. That same year, 5.8% of male deaths and 11% of female deaths were attributed to malignant neoplasms. Mortality from this cause is higher among women than among men, particularly in the age group 45–64. In that group, mortality from malignant neoplasms during the period 1980–1984 was 103.0 per 100,000 men but 223.4 per 100,000 women.

External causes constitute the principal cause of death among men, accounting for 28.0% of all male deaths from defined causes in 1990. Among women this cause group accounts for only 8.1%. Between 1980 and 1984 mortality per 100,000 population from external causes for the group aged 15–44 years was 212.1 among males and 26.7 among females. For the group aged 45–64 years the rate was 237.8 among males and 41.3 among females, and for the group 65 years and over mortality was 302.8 among males and 41.3 among females.

In 1990, diseases of the circulatory system accounted for 23.1% of all deaths from defined causes among males and 28.3% among females, with the greatest proportion of deaths occurring among persons aged 65 years and over. In that group, mortality from diseases of the circulatory system was 1,964.3 per 100,000 population in 1980–1984, whereas in the group aged 45–64 years the rate was 301.2 per 100,000.

Mortality from conditions originating in the perinatal period was estimated at 1,751.9 per 100,000 live births in 1980–1984. In 1990 this cause accounted for 1.5% of male deaths and 1.8% of female deaths.

Infant Mortality

In 1970 infant mortality in Honduras was estimated at 108.7 per 1,000 live births. By 1980 it had decreased to 72.6, and by 1985 the rate was 44.9 in urban areas,

61.1 in rural areas, and 55.5 in the country as a whole. The most recent estimates, which are for 1990, put the figure at 50 per 1,000 live births, with an urban-rural differential of 36 versus 59 per 1,000 live births. Among the urban population infant mortality was estimated at 38 for Tegucigalpa and San Pedro Sula and 35 for other urban areas.

The 1970 infant mortality rate among children of mothers without any formal education was 135 per 1,000 live births—three times higher than the figure of 45 reported for children of mothers with 7 or more years of schooling. In 1980 the rates of infant mortality were 112 per 1,000 live births for children of mothers without any formal education, 89 for those whose mothers had 1–3 years of schooling, 74 for those whose mothers had 4–6 years, and 39 for those whose mothers had 7 or more years. For 1990, the figures were 70 for children of mothers without formal education, 55 for those whose mothers had 1–3 years of schooling, 40 for those whose mothers had 4–6 years, and 25 for children of mothers with 7 or more years of schooling.

In 1989 a comparison was made of *municipios* according to the proportion of families with unmet basic needs (UBN). It revealed that in those where less than 10% of the population had UBN, mortality among children under 2 was 53 per 1,000 live births; where 10%–19% of the population had UBN, the rate was 50 per 1,000; where 20%–29% had UBN, it was 72; where 30%–39% had UBN, it was 69; where 40%–49% had UBN, it was 74; where 50%–59% had UBN, it was 85; where 60%–69% had UBN, it was 83; where 70%–79% had UBN, it was 86; and where 80% or more of the population had UBN, it was 100 per 1,000.

Maternal Mortality

A study carried out in 1989–1990, which examined all deaths of women of childbearing age (12–49 years), found 1,742 deaths of women in that age group in a 1-year period, 381 (21%) of which were maternal deaths. Of those deaths, 67.2% occurred outside a hospital, and of that proportion, 39.8% occurred during childbirth. Among deaths occurring in hospitals, 16% occurred during childbirth. Death during the puerperium accounted for 28.1% of the nonhospital deaths and 49.6% of the hospital deaths, including 30% that occurred in the first 24 hours following childbirth. These deaths were attributed to hemorrhage (32.8%), infections (20.7%), dystocia (4.2%), hypertensive disorders (12.3%), causes unrelated to pregnancy (17.6%), and other causes (12.3%).

Noteworthy among the variables studied was the significantly higher maternal mortality rate among women aged 35 or older (40 per 10,000 live births), compared with that among women aged 18–34 (21 per 10,000). Single women were found to have a rate of 29 per 10,000 live births, while among married women the rate was 17 per 10,000.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal, Child, and Adolescent Health

In 1987 the leading cause of death among children under 1 was infectious diseases, which accounted for 56% of all deaths in this age group; 41% were attributed to intestinal infections and 9% to vaccine-preventable diseases. Acute respiratory infections accounted for 18% of deaths, and conditions originating in the perinatal period, 14%.

The prevalence of diarrheal diseases among children under 5, as measured by the occurrence of diarrhea during a 15-day period prior to the date on which the survey was conducted, decreased from 30.2% to 18.6% between 1987 and 1991. This difference may be attributable in part to the time of year at which the surveys were carried out. The first was conducted during the rainy season, when the incidence of diarrheal disease rises. Part of the second survey was conducted during the rainy season, but most of it during the dry season, when the incidence of diarrheal disease diminishes. Nevertheless, the reduction in differences between urban and rural areas is notable: in Tegucigalpa and San Pedro Sula the prevalence of diarrheal diseases decreased from 25.5% to 18.8%; in other urban areas, it dropped from 28.4% to 17%; and in rural areas, the reduction was from 31.9% to 19.1%.

In 1992 the prevalence of acute respiratory infections was 33.3% for the country as a whole. There were no significant differences between areas (Tegucigalpa and San Pedro Sula, 32.2%; other urban areas, 32.7%; and rural areas, 32.2%).

Vaccine-preventable diseases have decreased as higher levels of vaccination coverage have been achieved. Coverage for the polio vaccine among children under 5 years increased from 83% in 1989 to 93% in 1992. In the latter year, coverage for the third dose of DPT vaccine among children under 5 years was 92.0%, and coverage for the measles vaccine among children under 1 year was 98.5%. No cases of po-

liomyelitis were reported in 1992. There were 58 reported cases of measles, but no deaths. The incidence of whooping cough was calculated at 8.7 per 1,000 population, which is equivalent to 425 suspected cases, out of which 4 deaths were reported. The cases were not confirmed.

Mortality in the group aged 5–14 years has declined substantially. It decreased from 343.4 per 100,000 population during the period 1960–1964 to 229.0 in 1970–1974 and to 160.0 in 1985–1989. Between 1970–1974 and 1980–1984 mortality from communicable diseases in this age group decreased from 183.5 to 101.1 per 100,000 among males and from 105.7 to 66.5 per 100,000 among females. During the 5-year period 1980–1984, communicable diseases were the leading cause of death in the group aged 5–14, accounting for 52.8% of all deaths from defined causes. Deaths from external causes, on the other hand, have increased in this age group. Among males, the rate rose from 32.9 per 100,000 in 1970–1974 to 42.5 in 1980–1984, and among women, from 9.0 to 14.7. During the 1980–1984 period, external causes accounted for 17% of all deaths from defined causes.

Of all the deaths registered in the country in 1990, 993 (5.8%) were of persons aged 5–14 years. In regard to the causes of death reported, 32% of the deaths were classified as due to signs, symptoms, and ill-defined conditions. Most of the remainder were attributed to communicable diseases (39.6%) and external causes (26.3%). Of all hospital discharges from both public and private sector institutions in 1992, 6.9% were of persons aged 5–14. External causes were recorded for 26% of the hospital discharges in this age group, while communicable diseases were the diagnosis for 14%; cardiovascular diseases and malignant neoplasms accounted for only 1.8% of hospital discharges of persons aged 5–14. Of the total 12,914 discharges, 8% followed treatment for appendicitis and hernia and 8% for bronchial asthma. The group aged 5–14 accounted for 14.8% of the total 4,590,099 outpatient medical visits. The most frequent causes for doctor visits were acute respiratory infections (20%) and bronchial asthma (5%).

Among the group 15–19 years of age, external causes accounted for 41.2% of all deaths from defined causes in 1990, and communicable diseases accounted for 19.8%. The age-specific fertility rate for this group was 124.4 per 1,000 females in 1981 and 131.9 in 1991. In urban areas, the fertility rate increased from 84.5 to 101.3 per 1,000, whereas in rural areas it decreased slightly from 163.2 to 159.2. Women in rural areas initiate sexual activity at an earlier age than women in urban areas. In 1991, 11.1% of women of childbearing

age (15–44 years) in rural areas reported having initiated sexual relations before the age of 15; the proportion was 4.6% in Tegucigalpa and San Pedro Sula and 8% in other urban areas. Accordingly, in the same year it was found that in rural areas 36.2% of women between 15 and 19 years of age were sexually active, while in Tegucigalpa and San Pedro Sula the figure was 24.5% and in other urban areas, 26.8%.

Health of Women

Working women in Honduras earn much less than men and are concentrated mainly in the service and sales sector. Their proportional participation in the labor force ranges from 9.4% in the department of Olancho, where the principal activity is agriculture, to 21% in the cities of Tegucigalpa and San Pedro Sula. In 1991, 79% of the women in the country were living in poverty, and 19.4% of poor households were headed by a woman.

In 1990 diseases of the circulatory system were the leading cause of death among women. They accounted for 28.3% of the deaths from defined causes, and the majority occurred among women aged 65 years or older. During the period 1980–1984, female mortality (all ages) from diseases of the circulatory system was 1,983.5 per 100,000, slightly higher than the male rate of 1,955.0. In contrast, in the same time period, mortality from this cause among the age group 45–64 was 286.1 per 100,000 for women and 317.4 for men.

In 1990 malignant neoplasms accounted for 11.1% of all deaths from defined causes among women and 5.8% among men. During the period 1980–1984 the mortality rate per 100,000 population from malignant neoplasms was 598.3 among women and 497.2 among men in the age group 65 and over. In the 45–64-year age group, female mortality was twice as high as male mortality during the same period: 103.0 per 100,000 among men but 223.4 among women.

Maternal deaths make up 21.7% of all deaths of women in the 15–49-year age group. Infectious and parasitic diseases account for 18.7% of the deaths in this age group; injuries and violence, 13%; and malignant neoplasms, 12.1%.

According to a recent analysis of women's health in Honduras, one of the most important but least documented problems of women is family violence. One study found that in 50.1% of cases, the aggressor is the woman's boyfriend, husband, or ex-boyfriend.

Morbidity statistics are disaggregated by sex only for the age group 15–49. In this group, most female

morbidity is related to pregnancy, childbirth, and the puerperium, and these causes account for 37% of all hospital discharges (male and female). The special surveys that have been carried out in this regard have focused primarily on fertility and utilization of reproductive health and child health services.

Health of the Elderly

In 1988, 3.4% of the population was 65 years of age or older, and 6.4% was 50–64 years of age. Existing data do not permit an adequate assessment of the health conditions of the elderly in Honduras for two reasons: first, underregistration of deaths in 1992 was higher than 60% for the group aged 65 and older, and 30% of the deaths reported were attributed to ill-defined conditions; and second, data on outpatient care is not disaggregated by age for the population over 15 years of age. In 1992, 24,923 hospital discharges from public and private institutions (13.3% of the total number) were of persons aged 50 or older. Diseases of the circulatory system accounted for 17.8% of those discharges. During 1980–1984 mortality from diseases of the circulatory system was 1,964.3 per 100,000 among persons aged 65 and over and 301.2 among persons aged 45–64. For both age groups, these diseases are the leading cause of death.

Digestive disorders accounted for 12.2% of hospital discharges of persons aged 50 or older in 1992. Communicable diseases accounted for 10.2%; external causes for 8.8%; chronic bronchitis, emphysema, and asthma for 8%; malignant neoplasms for 7%; and metabolic diseases, primarily diabetes mellitus, for 5.3%.

The city of Tegucigalpa shows an interesting pattern with regard to utilization of health services by persons aged 60 and over: 68.6% of women, but only 27.2% of men, utilize private medical services, while 15.7% of women and 11% of men receive health care through services for the indigent. Employees lose their social security benefits upon retirement.

Diseases and Health Impairments

Communicable Diseases

In a sample of 5% of all doctor visits in 1988, 16.5% were found to have been prompted by infectious and parasitic diseases and 13.9% by acute respiratory infections. These two causes together account for approximately 30% of the doctor visits in all the health regions

in the country, both in urban and rural areas. Dermatoses and urinary tract infections and vulvovaginitis accounted for 3.0% and 4.7%, respectively, of the doctor visits. More than 50% of all outpatient morbidity is due to communicable diseases.

In 1992 communicable diseases were the primary diagnosis associated with 16,915 hospital discharges, which was 9.1% of the total 181,617 discharges recorded that year in both public and private hospitals. Such diseases constitute the second leading cause of hospitalization, after pregnancy, childbirth, and the puerperium, which in 1992 accounted for 37.9% of all hospital discharges.

The proportion of service delivery units of the Ministry of Public Health and Welfare reporting data during 1992 averaged 55%–60%, with regional variations that ranged from 12%–85%. Several programs have their own information systems. The data presented here have been corrected according to the records of specific programs.

Vector-borne Diseases

Malaria. This disease has exhibited a cyclical pattern. In the last 6 years an increase has been noted in the number of cases, from 19,095 reported in 1987 (annual parasite incidence [API] of 5.26) to 70,838 in 1992 (API 18.05). In the latter year, health regions III and VI, located in the northern part of the country, reported 23,375 and 26,899 cases, respectively, which was 70.0% of the total number of cases diagnosed. In health region IV, in the south, the incidence of the disease has diminished by 56%. Transmission is most frequent in the second half of the year, which is the rainy season. High levels of transmission have also been associated with seasonal agricultural labor in areas where bananas, rice, sugar cane, cotton, and citrus fruits are grown. *Plasmodium vivax* accounts for 97% of the infections and *P. falciparum* only 2.2%, although a 160% increase in the latter has been observed recently in the northern area of the country.

In 1992 a total of 1,216 cases of *P. falciparum* infection were reported, 1,095 (90%) of which were diagnosed in health region VI. Within that region, one health area (number 4) accounted for 688 cases (56.6% of the total).

Dengue. Since it was recognized in Honduras in 1978, dengue has become established in virtually the entire country, with the highest numbers of cases occurring in large urban areas. In 1992 a total of 1,032 clinical cases were reported, which was a 60.5% de-

crease from the figure for 1991, when 2,615 cases were diagnosed. The metropolitan region and health regions II and III accounted for 483, 117, and 277 cases, respectively, or 84.9% of the 1,032 cases reported throughout the country. More than half (58.7%) of these cases occurred in July, August, and September. Of the 2,639 suspected cases that were analyzed, 422 (16.0%) were found to be seropositive for the dengue virus. Virus isolation studies have shown that serotypes 1, 2, and 4 have been present since 1990. In July 1992 one case of hemorrhagic dengue was detected in Tegucigalpa.

Chagas' Disease. The major vectors of Chagas' disease in Honduras are *Rhodnius prolixus* and *Triatoma dimidiata*. Based on prevalence studies carried out during 1983–1984, it is estimated that some 30,000 persons are infected and 1.2 million are at risk of acquiring the infection. In 1991, as part of several epidemiologic studies, serum samples from 18,843 persons from different endemic areas were examined and 4,321 (23.0%) were found to be positive. In the same year, 1,112 (50.3%) of 2,209 cases of cardiopathy compatible with Chagas' disease were found to be seropositive. In 1992, 10,601 serologic tests were carried out, of which 2,494 (23.5%) were found to be positive. Monitoring of blood banks in 1992 revealed 480 (1.4%) positive donors out of a total of 34,244; in 1987 a positivity level of 11.6% had been found. Testing for Chagas' disease is carried out in all the country's blood banks.

Vaccine-preventable Diseases

Poliomyelitis. Coverage with three doses of polio vaccine among children under 5 years of age was 83% in 1989 and increased to 93% in 1992. The last epidemic of poliomyelitis occurred in 1987, when 57 cases were reported. Five cases were reported in 1988, and only one in 1989. Between 1990 and 1993 no new cases of poliomyelitis were reported in Honduras. During 1990, 117 cases of acute flaccid paralysis were investigated; in 1991, 76 cases were investigated, and in 1992, 110, for a rate of 1.6 per 100,000 children under 15. In 1992 all the cases were evaluated clinically, electromyographically, and epidemiologically, and all stool samples were found to be negative for wild poliovirus. That same year, studies of wild poliovirus circulation were carried out in specific areas where wild poliovirus had been isolated from poliomyelitis cases in 1987 and which had high rates of acute flaccid paralysis. A total of 205 stool samples were collected from

"healthy children" under 5 years of age; a non-polio virus, such as another enterovirus or an adenovirus, was isolated from 71 of the samples.

Measles. Measles vaccination coverage among children under 1 year old was 89.0% in 1992. An increase in overall coverage among children under 5 has been achieved in the last 4 years. In 1992, 77% of the 291 *municipios* in the country had coverage levels of over 80%. During the 1970s the incidence of measles remained higher than 100 cases per 100,000 population, and during the 1970s and the 1980s, epidemics occurred every 4–5 years. In general, the incidence of the disease has tended to decline, with longer interepidemic periods during the 1980s.

The last epidemic occurred in 1989; it began in week 20 of that year and ended in week 30 of 1990. A total of 14,713 cases were reported, for an incidence of 287.8 per 100,000 population; 320 people died, making the mortality rate 6.4 per 100,000 population. The most heavily affected age group was that of children under 1 year, among whom the rate was 849.1 per 100,000, followed by school-age children (5–14 years), with a rate of 327.4 per 100,000.

In 1991 and 1992 the incidence of measles was 1.8 and 1.1 per 100,000 population, respectively. The rates were highest among children under 1 and children aged 5–14. There were no measles deaths reported in 1991 or 1992.

Diphtheria and Whooping Cough. Coverage with three doses of DPT vaccine in children under 5 years of age was 83% in 1989 and 92% in 1992. The incidence of whooping cough was 1.1 per 100,000 population in 1989 and 8.7 in 1992. In the latter year, 425 suspected cases of whooping cough were reported. All were investigated, and cultures were performed in 40% of the cases, but they yielded bacteria other than *Bordetella pertussis* in all instances. Of the total number of cases reported, the greatest proportion occurred in the under-1-year age group, and the next most affected group was that of children aged 5–14. Four deaths occurred among the suspected cases of whooping cough, three of which were of children under 3 months of age. The principal cause of death was pneumonia. No cases of diphtheria have been reported since 1980.

Tetanus. Coverage with two doses of tetanus toxoid among women of childbearing age (12–49) was 25% in 1989 and 68% in 1992. Of the total number of women of childbearing age in the country, 39% live in *municipios* rated as risk areas for the disease. Of this

group, 60% have received two or more doses of tetanus toxoid and 40% have received one dose. During the period 1985–1988 there were 86 hospital discharges related to neonatal tetanus. During the period 1990–1992 a total of 67 cases were reported.

AIDS and Other Sexually Transmitted Diseases

The incidence of syphilis has decreased but rates of gonorrhea and acquired immunodeficiency syndrome (AIDS) have risen. The first cases of AIDS were diagnosed in 1985. Of the total of 2,315 cases reported up to 1992, 75% involved heterosexuals, 10% bisexuals, and 6% homosexuals. The male-to-female ratio is 1.7:1. San Pedro Sula accounts for 40.2% of the cases and Tegucigalpa for 12.7%. The rest are concentrated basically in the northern part of the country, in cities close to San Pedro Sula. Of the patients diagnosed with AIDS, 23.5% also have tuberculosis.

Tuberculosis

BCG vaccination coverage among children under 5 was 85% in 1989 and 99% in 1992. In 1992 some 73% of the infants born in hospitals were vaccinated. Coverage for the group aged 5–7 years was estimated at 32%. In 1990 there were 144 cases in persons under the age of 15—a rate of 7.0 per 100,000 population.

The incidence of tuberculosis was 84.7 per 100,000 population in 1987, 77.1 in 1988, 69.9 in 1989, 63.6 in 1990, and 89.8 in 1991. These variations have been due more to changes in active case-finding than to a true fluctuation in incidence.

Acute Respiratory Infections

In 1990 acute respiratory infections (ARI) were responsible for 4.2% of all deaths from defined causes, or 551 deaths. Of these, 26.5% were of children under the age of 5 years and 25.4% were of persons aged 65 years or older. In 1992 ARI accounted for 17.3% of hospital discharges among children under 5 and 2.7% among persons aged 50 or older. Acute respiratory infections were also the reason for 13.9% of all outpatient medical visits in 1988.

Although ARI are a significant cause for utilization of health services, care was sought for only 30.5% of the children under 5 years of age who had experienced an acute respiratory infection in the 15 days preceding

a survey carried out in 1991–1992. Whereas in Tegucigalpa 47.1% of the children with an ARI received medical attention, in other urban areas the figure was 35.3% and in rural areas only 23.4%. In Tegucigalpa and San Pedro Sula a prevalence of 38.2% was reported among children under 5; in other urban areas the prevalence was 32.7% and in rural areas 32.2%.

Cholera and Other Intestinal Infectious Diseases

In 1990, 1,160 deaths from intestinal infections were recorded, of which 52.3% were among children under 5 years and 19.5% were among persons 65 or older. Diarrheal disease was listed as the primary diagnosis for 2.8% of hospital discharges in 1992. In 1988 this cause accounted for 16.5% of all outpatient medical visits. The results of a survey conducted in 1987 and 1991 on the prevalence of diarrheal disease in children under 5 years of age were reported above in the section on the health of children. That study found that the proportion of children with diarrhea who were taken to health services for attention in 1991 was 28.4% in Tegucigalpa and San Pedro Sula, 25.5% in other urban areas, and 19.8% in rural areas; nationally, the proportion was 22.4%. That same year, oral rehydration salts were used during 28.9% of episodes of diarrhea in Tegucigalpa and San Pedro Sula, 25.5% in other urban areas, and 34.4% in rural areas.

From January to October 1991 a total of 218,983 cases of diarrhea in children under 5 years were reported. For the same months in 1992, the figure decreased to 145,349 cases. The incidence of other diseases transmitted by the fecal-oral route such as typhoid fever, was 3.3 per 100,000 population in 1989, 3.1 in 1990, and 1.7 in 1991. For infectious hepatitis the rate per 100,000 population was 29.4 in 1989, 29.6 in 1990, and 19.4 in 1991.

The first case of cholera in Honduras was reported in October 1991. That year the disease was responsible for 17 cases and 4 deaths. In 1992, 407 cases and 17 deaths occurred. The epidemic began in the southern region along the border with El Salvador and later spread to the capital. By the end of 1992, cases had been reported in 12 departments and 56 *municipios*.

Cardiovascular Diseases

Mortality from diseases of the circulatory system declined from an estimated 374.5 per 100,000 population among men aged 45–64 in the period 1970–1974 to

317.4 in 1980–1984. Among women in the same age group and for the same periods, the mortality rate decreased from 358.0 to 285.1. In the group aged 65 years and over, the mortality level has remained relatively constant; for the period 1980–1984 it was 1,955.0 per 100,000 among men and 1,983.5 among women.

According to figures on the leading causes of death, diseases of the circulatory system accounted for 30% of male deaths during the period 1980–1984 and 23.1% in 1990. Among women, this cause accounted for 28.3% of all deaths from defined causes in 1990. For both sexes, the greatest proportion of deaths from diseases of the circulatory system occurred among the elderly: 50.4% of the deaths from this cause occurred in the group aged 65 and over, while the group aged 45–64 suffered 21% of the deaths. In 1992 diseases of the circulatory system accounted for 6,533 of the discharges from public and private hospitals (3.5% of the total number). Ischemic heart disease accounted for 18.9% of these discharges, hypertensive disease for 17.7%, cardiac insufficiency and dysrhythmias for 16.6%, cerebrovascular disease for 14.9%, and diseases of the veins and lymphatic vessels for 14.1%.

Malignant Neoplasms

Mortality from malignant neoplasms has shown a downward trend among men. In the age group 15–44 years it decreased from 25.2 per 100,000 during the period 1965–1969 to 13.5 in 1980–1984. Over the same period, the rate dropped from 148.1 to 103.0 per 100,000 males aged 45–64 years. Among women, in contrast, the rate changed very little, decreasing only slightly from 238.4 per 100,000 in 1965–1969 to 223.4 in 1980–1984 for the age group 45–64 years. In the age group 65 years and over the rate for 1980–1984 was estimated at 497.0 per 100,000 among men and 598.3 among women. Because of underregistration problems, no mortality rates can be calculated for more recent years.

In 1990, 5.8% of recorded deaths among males and 11.9% among females were attributed to malignant neoplasms. For 58.4% of these deaths the site of malignancy was not specified. In 1992 malignant neoplasm was the primary diagnosis for 3,160 hospital discharges (1.7% of the total number); cancer of the uterine cervix accounted for 24% of these discharges, breast cancer for 14.3%, stomach cancer for 12.7%, leukemias for 10.1%, cancer of the trachea, bronchus, and lung for 9.1%, and cancer of the colon and rectum for 7.8%. The greater frequency of malignant neo-

plasms among women is due to the relatively high proportions of breast and cervical cancer. Statistics on hospital discharges related to cervical cancer in 1992 indicate that invasive carcinoma accounted for 775 and carcinoma *in situ* accounted for 231, which is a ratio of 3.4:1. A breakdown of figures by sex is available only for the group aged 15–49, in which leukemia accounted for 35.8% and stomach cancer for 24.6% of the discharges among men.

Accidents and Violence

External causes were responsible for 28% of all male deaths recorded in 1990, making them the leading cause of death among males. The same year, external causes accounted for 8.1% of female deaths. Since the period 1965–1969, these causes have accounted for a growing number of deaths in the age group 5–19 years. Among males, mortality increased from 23.7 per 100,000 population in 1965–1969 to 42.5 in 1980–1984, while among women in this age group, the rate rose from 8.8 to 14.7. Of the 2,606 deaths from external causes recorded in 1990 only 7.5% were of persons aged 5–14. The greatest proportion of deaths from these causes (61.7%) occurred in the group aged 15–44, and of these 1,608 deaths, 1,402 were of males.

Among males of all age groups, 38.4% of the deaths from external causes in 1990 were due to homicide, 26% to drowning and late effects, 13% to traffic accidents, and 11.3% to poisoning. Among women in the same year, homicide accounted for 20.1%, drowning and late effects for 38.3%, and traffic accidents for 18.3%.

Records of hospital discharges do not specify the type of external cause but rather the type of injury. In 1992 there were 16,700 discharges related to external causes; 41.9% were due to fractures, 35.5% to wounds, 7.4% to burns, and 7.3% to poisoning. As was mentioned previously, these data are disaggregated by sex only for the age group 15–49 years. Of the 8,749 hospital discharges in this age group, 77.8% involved men.

Smoking

Tobacco use among persons aged 15 and older has decreased from 995 cigarettes per capita in 1988 to 807 in 1989. As for the prevalence of habitual smoking, a national survey conducted in 1987 showed that 6% of women of childbearing age smoked regularly, while a 1988 survey in urban areas found that 36% of males and 11% of females were regular smokers.

Generally speaking, smoking was found to be more prevalent among persons with higher levels of education. For both sexes, the prevalence among those with a secondary or higher education was 26%, while among those with less schooling it was 22%. Among women, the prevalence was 12% in the university-educated group, 5.6% among those with a secondary education, 4.7% among those with a primary education, and 9.7% among those with no formal education. Differences were also observed in relation to employment, the prevalence being 9% among working women and 4.8% among unemployed women. A smoking prevalence of 8.3% was found among women who indicated they were taking oral contraceptives, compared to 5.8% among those who were not taking them.

Oral Health

In 1991 it was estimated that 98.0% of school-age children in Honduras had dental caries and that only 53% of them brushed their teeth regularly.

Risk Factors

Food and Nutrition Situation

At the national level, 39.4% of children under 5 years of age are below two standard deviations with respect to appropriate weight-for-height; in 1987, 33.9% were in this category. In rural areas 46.5% chronic malnutrition was found in 1987 and 47.2% in 1991. In 1987, 19.2% were under one standard deviation below weight-for-height, while in 1991 the figure was 13.1%.

Only 5% of children show low weight-for-height during the first 3 months of life. After that point, there is a sharp increase in chronic and acute malnutrition up to the age of 23 months, when the weight-for-height indicator (acute malnutrition) drops to values similar to those observed during the first 3 months of life (prevalence of 5%–10%) and the height-for-age indicator (chronic malnutrition) stabilizes at levels close to 50%. Of the 1,029 families studied by a national survey of food intake, 56% had a deficit of 20% in terms of access to sufficient food to meet energy requirements; 5% were consuming less than half the amount they needed. According to a national height survey conducted in 1987 among first-grade schoolchildren (aged 6.5 to 9 years), 39.8% suffered from growth retardation with regard to height; in 1991 that figure was 34.9%.

Some 73% of the families had a vitamin A intake of under 300 μg daily. Among children under 5 years old, 76% (n=382 children) were ingesting less than 250 μg daily. The prevalence of endemic goiter decreased from 17.7% to 8.8% between 1966 and 1987. This reduction may be attributed to the iodization of salt, which commenced in the country in 1971. The prevalence of hemoglobin levels less than 10 g/dl among children under 5 years is 16.5%. Among females aged 10–44 deficient iron levels are found in 15.0% for hemoglobin and 12.3% for hematocrit. If the population with levels between 10 and 12 g/dl is included, the prevalence of iron deficiency could reach at least 40% of the Honduran population (that is, the proportion with values of under 12 g/dl). Anemia and nutritional deficiencies accounted for 5.4% of all outpatient medical visits in 1988.

The availability of food for human consumption has frequently been affected by increased industrial demand for grains, its consumption by animals, and losses during harvesting and storage. The diet of 80% of Hondurans is composed of corn, beans, rice, bananas, and starches (carbohydrates and vegetable protein). The composition of the diet has changed very little.

Breast-feeding of children under 1 year of age is practiced by 90% of mothers. On the average, breast-feeding continues for 18 months. Exclusive breast-feeding at 1 month of age decreased from 44.4% in 1987 to 26.1% in 1991–1992. It has been found that by the time they are 3 days old, more than half of the children have been given a "pacifier" (a traditional compound made of herbs wrapped in gauze and soaked in some bitter or sweet liquid), and a similar proportion have also received water mixed with some other substance, such as coffee, tea, or sugar.

Risks in the Physical Environment

The 1988 census showed that there were 3,716 villages, 27,425 hamlets, and 21 cities of 10,000 or more inhabitants. Over three-quarters (78.8%) of the total urban population lives in these 21 cities.

By the end of 1992 it was estimated that 82.9% of homes in urban areas had house connections to water supply systems and that 7.5% had easy access to a water supply system. This means that 9.6% of urban dwellings did not have access to an adequate means of water supply. For rural areas, the corresponding figures are 40.2% with house connections, 13.3% with easy access, and 46.5% without a water supply system.

For the country as a whole, 70.1% of the homes are served by some kind of water supply system and 29.9% do not have an adequate means of drinking water supply. In urban areas, 90.9% of dwellings have some type of excreta disposal facility, but of that proportion 41.4% rely on latrines of various kinds. In rural areas, 44.8% have some means of sanitary excreta disposal, while the figure for the country as a whole is 64.4% of dwellings.

Sixty-two localities, making up 87% of the total urban area, have a sewer system, but in 51 of them the system is in fair or poor condition. Only 4.5% of the localities with sewerage have some means for treating wastewater. Less than 3% of domestic wastewater receives treatment prior to being discharged into some body of water.

Coverage for collection of solid waste is approximately 70% in the Central District and 65% in San Pedro Sula. Solid waste is disposed of in controlled landfills. In the other cities and population centers, solid waste management is deficient or nonexistent. For urban areas in general, coverage is estimated at only about 60%. Solid waste from hospitals and other medical care institutions are transported to municipal refuse dumps.

There is very little treatment of industrial wastes. Several bodies of water show high degrees of pollution by domestic and industrial liquid waste. Studies conducted in 1992 demonstrated that the Coluteca River was polluted at the point where it flows through Tegucigalpa, and another study carried out in 1993 also found the Chamelecon River in San Pedro Sula to be contaminated. In 1990 high degrees of contamination by a variety of metals were found in sediments from Yojoa Lake, a commercial fishing site.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

Since 1990 the country has had two main policy thrusts. One focuses on economic policies aimed at stabilizing the balance of payments, which occupy a central position, while the other places emphasis on sectoral adjustment. During 1992–1993 the social, education, and health sectors were targeted for adjustment.

The shift in overall policy has been reflected in the trend in public spending and investment, which in

turn has had an impact on spending and investment in health. Public spending between 1982 and 1988 ranged from US\$ 525.1 million to US\$ 599.0 million (in constant 1988 dollars). It reached a high point in 1989 at \$631.9 million and then declined to \$315.1 million in 1990 and to \$239.4 million in 1992 (also in constant 1988 dollars). Despite this reduction, the percentage of spending devoted to public investment increased from 16.6% in 1990 to 27.2% in 1992, but public investment in the social sectors—which in 1990 was US\$ 15.3 million (in constant 1988 dollars), or 29.2% of all public investment—decreased to 9.7% of the total in 1992. In terms of millions of constant 1988 dollars, public investment in health increased from 0.09 in 1990 to 1.5 in 1992, while public investment in the environment and environmental sanitation fell from 12.6 in 1990 to 6.0 in 1992. In the latter year, of the total amount invested, 53% went to the Ministry of Public Health and Welfare, 4% to the Honduran Social Security Institute, and 43% to the Honduran Social Investment Fund and the National Child Welfare Agency, the latter being entities that operate social assistance programs. In 1986 the Ministry invested US\$ 5.1 million in health (in constant 1988 dollars), which was 92.7% of the total investment in the sector. The Ministry of Public Health and Welfare has relinquished some responsibilities to the institutions that operate social assistance programs.

Compensatory Social Programs

At the same time that adjustment programs were being implemented in the 1990s, two social compensatory social programs were created that are directly related to the health sector: the Honduran Social Investment Fund (FHIS) and the Family Allowance Program. Some 13.5% of all the projects funded by the FHIS are related to health and nutrition, with the Fund providing 34.7% of the financing for such projects. Among the health projects carried out, 21% involved the expansion of health centers; 21.8%, the construction of child feeding centers; and 29.1%, drinking water supply and basic sanitation. Almost half (46%) of these projects were carried out in the departments of Francisco Morazán and Choluteca; less than 10% were carried out in the poorest departments, which are those located along the border with El Salvador.

The Family Allowance Program has four projects under way: one for the provision of vouchers to female

heads of household, which began in May 1990; one for the provision of maternal and child health vouchers, begun in December 1991; the job training program, launched in June 1991; and the education grants project, under way since 1992. The maternal and child voucher project reached a total of 55,722 beneficiaries in six departments. Provision of these vouchers has helped to increase the coverage of health services, as evidenced by the fact that in participating health centers first-time visits increased by 69.4% and follow-up visits by 165.6%.

Nongovernmental organizations provide a major portion of the funding for social assistance projects. At present there are 150 such organizations that participate in health projects in Honduras, only 39 of which are affiliated with some umbrella organization.

Public Sector Financing and Spending on Health

During the 1980s the health sector maintained a 10% share of the government budget. In 1982, 19% of the health budget came from external sources; by 1986 this figure had risen to 37%, in 1990 it was 34%, and in 1991 external sources contributed 26% of the budget of the Ministry of Public Health and Welfare (11% grants and 15% loans). Of the total health budget, 37% was allocated to hospital medical care, 23% to capital transfers to autonomous agencies, 21% to control of communicable diseases (including outpatient care and development of human resources), 8% to studies for the construction of health services, 5% to environmental sanitation, 2.8% to central administration, 1.9% to regulatory services, and 1.3% to miscellaneous expenditures. Of the budget for environmental sanitation, 36% was allocated to basic sanitation, 6% to food safety activities, and 57% to vector control.

The country's economic policies have had an impact on drug prices, which have increased by up to 250% in recent years. Per capita spending on drugs in 1992 was US\$ 1.92. Consumer drug costs during the period 1989–1991 rose by 87.3%. Cumulative inflation for health-related items was 73% during the period 1990–1991. The pharmaceutical industry is represented by 30 production laboratories. Marketing of imported drugs is regulated by the Department of Production and Consumption of the Ministry of the Economy and Commerce, which establishes the amount of markup allowed at the 119 drug stores and the 465 pharmacies in the country.

Social Security

In 1991 the social security system covered 893,311 persons, of whom 350,497 were contributing beneficiaries and the rest were their family members. Of the contributing beneficiaries, 58% live in Tegucigalpa and 32% in San Pedro Sula.

The health insurance and maternity benefits program has been operating at a deficit, which has grown steadily. In contrast, the program for disability, old-age, and death benefits shows a surplus. Old-age benefits account for 67% of the total amount expended for disability, old-age, and death benefits, and there are 25.3 persons receiving such benefits for every 1,000 social security contributors.

Streamlining of the Health Services System

Social assistance programs are carried out in close collaboration with the Ministry of Public Health and Welfare at the regional and local levels. Investment, assistance, and social security programs have been concentrated basically in urban areas, leaving the Ministry responsible for providing services to populations living in rural and remote areas, which show higher levels of poverty. It was in this context that a proposal was made in 1993 to streamline the health services system in conjunction with efforts to streamline the State. The Ministry of Public Health and Welfare has been responsible for overseeing both the development and revision of the proposal and its execution, thus fulfilling its role as the lead agency in the sector.

For the period 1991–1992 the Ministry of Public Health and Welfare proposed a strategy for adjusting the activities of the health sector to address the social problems engendered by the structural adjustment of the economy. It also suggests other strategies for achieving national and sectoral policy objectives.

The proposal for streamlining defines eight strategic areas of action: adjustment of the organization of the national health system; financing, including acquisition, distribution, and use of financial resources; acquisition and administration of critical supplies; retraining and development of human resources; development of strategic monitoring and evaluation systems; appropriate channeling and administration of external cooperation; development of management and leadership capacity in institutions and in the system that links them; and development of the environ-

ment, including drinking water supply, basic sanitation, and environmental management.

Legislation

The health code currently in force was adopted in 1990. Progress toward decentralization has been made under the Municipal Government Law (Decree No. 134-40, January 1991), which gives the municipal governments responsibility for beautification, cleanliness, and sanitation within the *municipio*; protection of the ecology and environment; and coordination of actions and measures aimed at safeguarding health and well-being in accordance with the health code.

Organization of Services

Infrastructure

Health services are provided in the public and private subsectors. In the public subsector, the institutions involved in personal health care are the Ministry of Public Health and Welfare (which covers 60% of the population), the Honduran Social Security Institute (which covers 13% of the population), the National Social Welfare Board, the National Child Welfare Agency, and the Department of Occupational Medicine, Health, and Safety of the Ministry of Labor. The private subsector comprises 56 hospitals with a total of 1,411 beds—24% of all hospital beds in the country.

Activities in the area of environmental health are carried out by the Ministry of Public Health and Welfare, the National Autonomous Water Supply and Sewerage Service, the Center for the Study and Control of Pollution, the National Commission on the Environment and Development, the Municipal Water Division of San Pedro Sula, the Municipal Development Division of Puerto Cortés, other municipal government agencies, and the Sanitation Division of the Municipal Government of the Central District.

The services of the Ministry of Public Health and Welfare are organized into six levels of care, ranging from services offered at the community level to highly sophisticated national hospitals. The first (community) level is composed of volunteer health workers and midwives. These workers are recruited and trained by service-delivery units, which teach them basic skills and supply the resources they need to carry out their duties. The volunteer health workers provide care for

simple health problems, such as ARI, diarrheal diseases, and nutritional problems, in addition to detecting and referring persons with symptoms of respiratory disease, promoting vaccination, monitoring children under 5 years old and pregnant women, and coordinating and providing instruction in the construction of latrines and wells. The midwives deliver babies—attending 54% of births—and also provide prenatal and postpartum care as well as care for newborns. The training of midwives and the creation of maternal and child clinics to which they will have access are currently priority activities in the area of maternal and child health.

At the other levels (second through sixth) there are a variety of entities administered by the Ministry, including 590 rural health centers (CESARES), staffed by nursing auxiliaries; 189 health centers providing medical care (CESAMOS); 14 area hospitals; 6 regional hospitals; and 5 national hospitals. The priority populations for the rural health centers are children under 5 and pregnant women, and family planning is an important component of their work. The health centers providing medical care vary in terms of size and the qualifications of their personnel. In general they provide outpatient medical care on demand. The area hospitals offer care in four basic specialties: pediatrics, gynecology and obstetrics, internal medicine, and surgery. More complex care is provided by the regional and national hospitals. Area hospitals account for 25.5% of all hospital discharges in the public sector, regional hospitals for 28.2%, and national hospitals for 46.3%.

Administratively, the services network is organized into nine health regions, which are divided into 35 health areas.

The Honduran Social Security Institute operates three hospitals (two in Tegucigalpa and one in San Pedro Sula) and four outpatient clinics (two in Tegucigalpa and two in the department of Cortés). As part of a process of social security expansion currently under way, agreements have been established for beneficiaries to receive care through private clinics, one regional hospital, and two area hospitals.

Pharmaceutical services have been developed and organized in 20 hospitals administered by the Ministry of Public Health and Welfare. Twelve of these services are managed by a professional pharmacist; they are located in 10 national hospitals, 1 regional hospital, and 1 area hospital. The public sector, which includes the Ministry of Public Health and Welfare and the Honduran Social Security Institute, has 87 operating rooms, 29 laboratories, 29 X-ray units, and 46 delivery tables.

Coverage

In 1988, visits to the various medical centers in the country totaled 3,910,072. Prenatal check-ups, growth and development monitoring, and visits to health personnel other than a physician accounted for 12%. In 1992, facilities of the Ministry of Public Health and Welfare accommodated 4.6 million outpatient visits. The Honduran Social Security Institute provided services for 1.2 million visits in 1991, which was an increase of 130,000 over the number of visits in 1988. Of all the outpatient care provided by the Ministry in 1992, 46% involved persons being seen for the first time.

In 1991 the Ministry of Public Health and Welfare had 3,703 beds, from which there were 172,772 discharges. The Honduran Social Security Institute had 599 beds and 54,644 discharges. In the same year, these two institutions reported a total of 1,096 pediatric beds, 888 internal medicine beds, 810 gynecology-obstetrics beds, 709 surgery beds, 199 orthopedics beds, and 42 intensive care beds. In 1992 the number of beds available in Ministry institutions increased to 4,051, of which 2,053 were in the national hospitals in Tegucigalpa and 377 were in San Pedro Sula, 832 were distributed among the six regional hospitals, and 789 were in area hospitals.

Of all hospital discharges, 73.7% were from public-sector hospitals, 15.7% from hospitals of the Honduran Social Security Institute, and 10.5% from private sector hospitals.

A national study of a sample of 11,233 women showed that overall 43% of these women took their children for well-child care, with the number of visits averaging five per child. The percentage of women seeking well-child care for their children rose as levels of education increased, as did the average number of visits. A similar pattern was observed among urban women, younger women, and women with lower parity, in comparison with their rural counterparts, older women, and those with higher parity. Children born in private institutions had a higher probability of receiving well-child care and were taken for more well-child visits.

The prevalence of oral contraceptive use increased from 17.7% of women of childbearing age in 1981 to 26.6% in 1987 and 29.8% in 1991. Among women living with a male partner, the prevalence of use of any contraceptive method went from 26.6% in 1981 to 34.9% in 1984, 41.9% in 1987, and 48.4% in 1991. These increases are due mainly to the increased use of voluntary surgical sterilization, which rose from 8.0% in 1981 to 15.6% in 1991; condoms, which increased from 0.3% to 3.0%; intrauterine devices, which rose from 2.4% to 5.1%; and natural methods, which went up from 3.2% to 13.6%.

Human Resources

In 1993 the economically active population of Honduras numbered an estimated 1.7 million; health personnel made up 0.9% of the total. The health work force is 61% female, and 60% of the workers are employed in the departments of Francisco Morazán and Cortés, where the cities of Tegucigalpa and San Pedro Sula are located.

In 1991, the Ministry of Public Health and Welfare employed 70% of all health personnel, or 10,751 workers. Only 3,904 were engaged in providing outpatient care. In 1993 this figure increased to 4,150, but direct personal health care is mostly provided by 286 physicians and 1,190 nursing auxiliaries. Of all the personnel employed by the Ministry, 12% work in the Metropolitan Region and 10% at the central level of the Ministry.

By professional category, the health work force comprises 3,803 physicians, 1,352 nurses, 622 dentists, 975 pharmacists, 213 psychologists, 1,043 social workers, 4,936 nursing auxiliaries, 236 laboratory technicians, and 211 pharmacy auxiliaries. Only 7.5% of the physicians, 13% of the nurses, 12.5% of the dentists, 3.6% of the pharmacists, and 24.1% of the nursing auxiliaries are engaged in providing outpatient care in Ministry facilities. All the schools that train health professionals are public, as all are affiliated with the National Autonomous University of Honduras.

JAMAICA

GENERAL HEALTH SITUATION AND TRENDS

Jamaica is an island of 10,991 km² that lies about 885 km south of Miami (United States of America) and 145 km south of Cuba. Traditionally, Jamaica's economy was based in agriculture; sugar, bananas, and citrus were the leading foreign exchange earners until the 1960s, when bauxite mining increased in importance as a source of foreign exchange, surpassing the agricultural sector. Since the 1980s, with the decline in aluminum prices worldwide, the bauxite industry has been second to tourism as the leading hard currency earner. In 1991, tourism (gross visitor expenditure) amounted to US\$ 764 million, bauxite/aluminum accounted for US\$ 662 million, and agriculture US\$ 178 million.

From 1988 to 1991 Jamaica's trade deficit averaged US\$ 706.9 million per year, with a low of US\$ 566.3 million in 1988 and a high of US\$ 822.0 million a year later. The 1991 trade deficit was US\$ 654.3 million.

"Structural adjustment" strategies—removal of foreign exchange controls and the liberalization of the local currency (which resulted in a depreciation of the Jamaican dollar against the United States dollar by 60.9% in 1991, versus 25.7% in 1990), a substantial increase in the money supply (54.6% in 1991 versus 19.3% in 1990), policies aimed at reducing the fiscal deficit, the removal of subsidies and price controls, and the liberalization of wage guidelines—all contributed to making 1991 the most inflationary year in Jamaica since World War II.

In 1991 the rate of inflation reached 80.2%, far surpassing the previous high (in 1978) of 49.4%, and greatly exceeding the rates of 8.5%, 17.2%, and 29.8% recorded in 1988, 1989, and 1990, respectively. Increase in the expenditure group "health care and personal expenses," which grew at a rate of 87.3%, was second only to "fuel and other household supplies" (94.0%) and led "food and drink" (84.3%).

At the same time, there was an estimated 3.3% central government fiscal surplus with respect to the estimated gross domestic product recorded in 1991–1992. In comparison, that surplus was 0.2% in 1990–1991, 2.7% in 1989–1990, and -6.1% in 1988–1989.

In 1989 and 1990 the labor force averaged 1,062,900 and 1,058,500, respectively. In 1991 the labor force increased by 1.3% and averaged 1,077,400 persons, of whom 46.7% were female. Unemployment rates for 1989, 1990, and 1991 were 18.0%, 15.3%, and 15.4%, respectively (10.9%, 9.1%, and 9.4% for males, and 26.1%, 22.5%, and 22.2% for females, respectively). The traditionally female-dominated service sectors remained so.

The self-employment occupational category recorded the largest increase. Self-employed persons accounted for 38% of all those employed. This trend is supported by government policies to enhance development of small and micro-businesses.

In 1989 male heads of household accounted for 30.8% of the employed and their female counterparts 15.6%. Each year in the period 1989–1991 saw an increase in the employment of female heads of household; nevertheless, in 1991, 29.7% of the work force was male household heads, while 15.9% was female household heads.

Population

Jamaica conducted a decennial population census in April 1991. Although final results are not available, preliminary analysis puts the island's total population at 2,366,067. The growth rate during 1991 is estimated to have been 0.9%, while the average annual rate during the 1982–1991 intercensal period was 0.86%, compared to 1.59% per year in the previous decade.

The reliability of birth data is affected by underreporting and subsequent lack of registration of births. There are also delays in the registration of deaths and coding of data. Bearing in mind these uncertainties, the crude birth rate in 1991 was estimated at 24.7 per 1,000 population, while the crude death rate was 5.5 per 1,000. For 1989 and 1990 the estimated birth rates were 24.0 and 24.8 and the estimated death rates were 6.0 and 5.1. In most years the natural increase in population (19.2% in 1991) is countered to a significant extent by emigration. In 1990 and 1991 emigration reduced the natural increase by 52% and 56%, respectively.

The population is distributed unevenly across the country. National population density is 215.3 persons per km², but close to 43% of the nation's total population lives in Kingston (the capital city) and the surrounding Saint Andrew metropolitan area.

Jamaica's population continues to be young, with slightly more than half the population being less than 25 years old. In 1991, the 0–4 age group grew by 2.3% and the school population was 34.6% of the total population (33.3% in 1990). The labor force (persons 15–59 years old) accounted for 57% of the total in 1991, which represents no appreciable change over all previous years. People 60 years and over currently make up about 10% of the population (Table 1).

In 1991 males represented 49.98% and females 50.02% of the population. Life expectancy at birth is approximately 68.1 years for men and 76.2 years for women (compared to 67.0 and 71.0, respectively, in 1980).

Mortality and Morbidity

Mortality information, including cause-of-death coding, is processed by the Registrar General's Department. Reporting and processing of death information is not up to date; 1987 is the most recent year for which data are available. The quality and, in particular, the specificity of cause of death entered on death certificates continues to be unknown. Prompt and accurate coding of cause of death has suffered from a lack of trained staff.

In 1987, the total number of deaths (recorded by the Registrar General) among all ages was 11,933, which equals a rate of 507.6 per 100,000 population. Of these, 6,011 were females and 807 were children aged 0–4 years (both sexes). The leading causes of death for all ages in 1987 were: neoplasms (ICD-9, 140–208), 2,072 deaths; heart disease (390–429), 1,964 deaths; cerebrovascular diseases (430–438), 1,888 deaths; diabetes mellitus (250), 1,032 deaths; accidents and violence (E800–E949, E960–E978), 994 deaths; diseases of the upper respiratory tract (460–466), 736 deaths; diseases of the digestive system (530–579), 368 deaths; diseases of the urinary system (580–599), 322 deaths; diseases of the nervous system (320–359), 270 deaths; and nutritional deficiencies (260–269), 217 deaths.

Available morbidity information is derived from government hospital reports of discharge diagnosis and government health center reports of reasons for visits. Data from the few private hospitals, from private physicians, or from patients who traveled out of Jamaica for care, especially in instances of major illness, are not available.

TABLE 1
Population by age and sex, Jamaica, 1991.

| Age group (years) | Total | Males | Females |
|-------------------|-----------|-----------|-----------|
| All ages | 2,435,660 | 1,217,450 | 1,218,210 |
| Under 15 | 802,740 | 406,290 | 396,450 |
| 15–29 | 758,520 | 380,490 | 378,030 |
| 30–44 | 406,280 | 199,430 | 206,850 |
| 45–59 | 224,090 | 115,030 | 109,060 |
| 60+ | 224,030 | 116,210 | 127,820 |

Source: Planning Institute of Jamaica, Economic and Social Survey, 1991.

For the period 1988 to 1990, "normal delivery" was the first-ranked discharge diagnosis for all ages at government hospitals, while complications of pregnancy and accident and other violence alternated between second and third rank. In 1989 these three causes represented 26.3%, 12.8%, and 12.1%, respectively, of all discharges. They were followed by genitourinary tract disease, cardiovascular disease, respiratory tract disease, neoplasm, gastroenteritis, and diabetes.

The two main reasons for curative visits to government primary health care facilities, during the period 1989 to 1991, were wound dressings and hypertension. Of the 1,019,182 visits to government health centers in 1989, 22.2% were for dressings and 13.4% for hypertension. In 1991 the number of visits was 1,040,553, of which 21.0% were for dressings, 12.6% for hypertension, 7.8% for respiratory tract infection, 5.5% for sexually transmitted diseases, and 5.0% for diabetes—the five leading reasons for visits.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

The perinatal mortality rate for 1991 was 30.4 per 1,000 registered live births. This represents an improvement over the 1990 rate of 32.9. The neonatal mortality rate in 1991 was 12.8, down from 14.5 in 1990. Owing to the underregistration of births and problems with the reporting and recording of infant deaths, the figures may not be accurate. However, for 1987 the infant mortality rate was estimated by the statistical department at 27 per 1,000 live births. There were 581 registered deaths in the under-1-year age group.

In 1987, the leading causes of death in the 0–1-year age group were: certain conditions originating in the perinatal period (ICD-9, 760–779), which was respon-

sible for 140 deaths, or 24.1% of the total of 581 deaths; intestinal infectious diseases (001-009), 96 deaths (16.5%); diseases of the respiratory tract (460-466), 95 deaths (16.4%); nutritional deficiencies (260-269), 83 deaths (14.3%); and congenital anomalies (740-759), 42 deaths (7.2%). The five top-ranking causes of death remained the same for 1984 and 1987, but the rank order differed. These leading causes of death accounted for 78.5% of all deaths within this age group.

Although the causes of perinatal mortality were not properly recorded, stillbirths were recorded at government hospitals, where 80% of all births occur. Not all stillbirths from home deliveries were recorded. Using available data, the stillbirth rates per 1,000 live births for the period 1989-1992 were 14.9, 15.5, 16.1, and 17.4. In government hospitals, the average percentage of babies with birthweight less than 2500 g for 1989-1992 was 8.6%. The values for each year were 8.5%, 8.6%, 9.0%, and 8.2%. It is not known how many low birthweight (LBW) babies die within the perinatal period.

Fifty-one cases of congenital syphilis were reported in 1989, 61 in 1990, 58 in 1991, and 56 in 1992.

In the 1-4-year age group, diseases of the respiratory tract (ICD-9, 460-466) ranked as the leading cause of death in 1987. The total number of deaths from this cause was 49, or 16.4% of the 298 registered deaths. Other leading causes were intestinal infectious diseases (001-009), with 42 deaths (14.1% of the total); diseases of the nervous system (320-359), 39 deaths (13.1%); nutritional deficiencies (260-269), 37 deaths (12.4%); and congenital anomalies (740-759), 27 deaths (7.0%). The five leading causes accounted for 63.1% of the deaths in this age group.

Mortality data on accidents and other violence are not disaggregated by age, and though accidents are common in childhood, it is not known how they contribute to mortality and morbidity within this age group. However, police data indicated that in the pedestrian population under 15 years old, there were 54 deaths in 1990, 52 in 1991, and 69 in 1992 due to road traffic accidents.

In 1987, the five leading causes of death in the 0-4-year age group accounted for 69.7% of the 879 deaths in infants and children. These causes were: diseases of the respiratory tract (ICD-9, 460-466), 144 deaths (16.4%); certain conditions originating in the perinatal period (760-779), 140 deaths (15.9%); intestinal infectious diseases (001-009), 138 deaths (15.7%); nutritional deficiencies (260-269), 120 deaths (13.7%); and diseases of the nervous system (320-359), 71 deaths (8.1%).

In 1989 the leading cause of admission to hospital among infants (accounting for approximately 24% of all under-1-year-old admissions) was conditions originating in the perinatal period. Gastroenteritis, which ranked second, accounted for 20% of all admissions that year. (Prior to introduction of the Control of Diarrheal Disease Program in the mid-1980s, gastroenteritis was the leading cause of admission among this age group.) Diseases of the respiratory tract (15%) ranked third, followed by the cause group accidents, poisoning, and violence (4%) and nutritional deficiencies (3%). The total number of admissions for all causes was 6,154.

For the 1-4-year age group, diseases of the respiratory tract ranked first and accounted for 24% of all admissions. Accidents, poisoning, and violence (19%), gastroenteritis (19%), skin disease (2%), and appendix and hernia (2%) were the other leading causes. The total number of admissions was 8,908.

For the age group under 5 years, the leading diagnoses in 1988 and 1989 were pneumonia, accidents, gastroenteritis, and skin diseases. In 1991 the last of these was replaced by congenital anomalies.

During 1992, gastroenteritis in children under 5 years occurred at an average ratio of 3.24 per 100 total patients (all ages) seen at sentinel sites, where a total of 18,932 gastroenteritis cases were recorded. However, the health centers recorded 13,294 cases for 1992, 66% of which were not dehydrated while 2.3% were severely dehydrated. The Children's Hospital reported 14,140 cases seen in the emergency room and 1,076 admitted.

The rate of access to oral rehydration salts was 90%, and oral rehydration therapy (ORT) was the main treatment. Intravenous fluids were administered to 2.6% (367) of the cases seen at the health centers and 11.7% (1,039) of the cases seen at the Children's Hospital. At these treatment facilities, case fatality remained at less than 1%.

Congenital sexually transmitted diseases and AIDS are of growing concern in the under-5-year age group. In 1992, there were 50 cases of congenital syphilis and 89 cases of ophthalmia neonatorum. During the period 1986 to 1992, there were 41 pediatric AIDS cases (0-9 years), of whom 28 died, for a fatality rate of 68.3%. The cumulative total (1986-1992) for AIDS was 26 cases in the under-1-year age group, 14 cases in the 1-4-year group, and 1 case among 5-9-year-olds.

Malnutrition is the main nutritional disorder. In 1992, 92.6% of the children 0-5 years old attending child health clinics were graded normal, while 6.9% and 0.5% had malnutrition grades II and III. In 1991 the

figures were 93.3%, 6.5%, and 0.3% for normal, grade II, and grade III, respectively, based on the WHO weight-for-age criteria. The percentage of children receiving breast milk only, as reported at the postnatal visit (6 weeks after delivery), was 45.7% in 1989, 47.0% in 1990, 47.5% in 1991, and 50.1% in 1992.

During the first and second quarters of 1992, 10.3% and 8.2% of all admissions to the National Children's Hospital were for malnutrition (undernutrition). Of the malnourished admissions, 74.9% were aged 6–23 months. In 1989, 1990, and 1991, 3.5%, 3.8%, and 7.2%, respectively, of all admissions were malnourished cases. In 1990, 0.9% of admissions to the hospital were for a combination of malnutrition and gastroenteritis.

Child abuse and neglect is thought to be on the rise, as more cases are being reported to police and social services. Moreover, the number of children brought before the courts for care and protection increased by 38% from 1986 to 1987. In Kingston alone there were an estimated 15,000 street children in 1989. For economic reasons, children in the 0–4-year age group are often left unsupervised or under the supervision of older siblings, who frequently have to stay away from school to babysit. In the late 1980s only 6% of children 0–4 years old had access to recognized day-care services.

Adolescent and Adult Health

The five leading causes of death for all ages (including children under 15 and the elderly) in 1987 were malignant neoplasms, heart diseases, cerebrovascular diseases, diabetes, and accidents and violence. These causes accounted for 67% of all deaths and were also the main causes of death in the over-15 age group.

The morbidity patterns as reflected by hospital admissions show a similar pattern to that of mortality, except that "normal delivery" ranked first for the past 5 years. In 1989, the leading causes of admission to hospital were normal delivery, complications of pregnancy, accidents, cardiovascular disease, and diseases of the respiratory tract.

The fatality rate for traffic accidents was estimated at 4.1 fatalities per 1,000 vehicles. During the period 1980–1991, accidents recorded by the police increased by 62.5%. A similar pattern of increase was noted for the number of injuries and fatalities. In the 1990–1991 period, accidents increased by 8%, while the vehicle fleet increased by only 1.6%.

In 1991 police records showed that there were 7,861 road traffic accidents, which resulted in 3,208 personal

injuries and 444 deaths. Of the 170 pedestrian deaths, 118 were in the age group 15 years and over. In 1989 there were 6,608 accidents and 400 deaths, and in 1991, 7,276 accidents and 393 deaths.

A recent evaluation of treatment centers by the National Council on Drug Abuse revealed that the majority of addicts in treatment used cocaine/crack or multiple substances and were aged 20–39 years.

The cumulative total of adult AIDS cases was 391 for the period 1982 to 1992, of which 256 were males and 135 females. The adult male to female ratio was 1.9:1 (at the end of 1992). Cumulative adult deaths for the same period totaled 273 (174 males, 99 females), with an adult mortality rate of 69.8%. The place of acquisition of HIV for adults was local, mainly within the heterosexual population (275 of 391 cases). Risk behaviors of adult cases in order of importance were heterosexual contact, male homosexuality, male bisexuality, and cocaine/crack use and blood transfusion. Among the adults, the main groups at risk were migrant farm workers, prostitutes and informal commercial importers, and sailors. A study conducted by the Ministry of Health's Epidemiology Unit showed that one out of 30 sexually transmitted disease (STD) clinic attendees is infected with HIV.

Records of the National Family Planning Board indicate that 25% of births in 1989, 1990, and 1991 were to teenaged mothers. Problems encountered as a result of teen pregnancies were toxemia, retardation, prematurity, low birthweight, and maternal social problems. The average age of first sexual intercourse was 13.1 years. The study showed that by 14 years 16% of adolescents were sexually active, 36% by 16 years, 77% by 18 years, and 80% by 20 years. This population frequently did not use contraceptives during the first sexual encounter, experienced unintended pregnancies, and often had multiple partners; many never used contraceptives. However, when contraceptives were used, the preferred methods were condoms and oral contraceptives.

A 1992 study in Kingston schools of girls 13–14 years old revealed the following sexual abuse and violence: 30% had been subjected to verbal enticement, 32% had had unwanted sexual contacts, 13% had experienced attempted rape, and 4% had been raped. With respect to violence, the girls reported witnessing fights at school or in the community (32%); being afraid to go to school because of violence there (4%), teasing (8%), or beatings by a teacher (8%); being involved in fights at home (8%), in the community (12%), at school with a weapon (8%), and at school without a weapon (21%); and being beaten by a parent by hand (38%), by a par-

ent with an implement, by a teacher by hand (20%), and by a teacher with an implement (57%).

Health of Women

In 1987, the five leading causes of mortality in females in rank order were cerebrovascular diseases, malignant neoplasms, heart disease, diabetes mellitus, and disease of the respiratory tract. Malignant neoplasms of the lip, oral cavity, pharynx, digestive organs, and peritoneum accounted for 34.5% of all female cancer deaths. Neoplasms of the cervix, uterus, ovary and uterine adnexa, and breast are also causes for concern because of their increasing numbers.

Maternal mortality for 1991 was 5.6 per 10,000 live births, with a total of 25 deaths. In 1990, the rate was 7 per 10,000 live births (42 deaths). However, there may be some element of underreporting, as maternal deaths on gynecological wards are not always registered as such.

In 1989, females accounted for 67% of all hospital admissions, 58% of which were for obstetric care and 19% of which were for complications of pregnancy, childbirth, and the puerperium. Accidents and violence, cardiovascular diseases, and diseases of the genitourinary tract ranked third, fourth, and fifth, respectively, as causes of female hospital admissions.

Anemia screening is carried out among the antenatal population by monitoring the hemoglobin levels. In 1992, 44.2% of pregnant women attending government services were tested at the first antenatal visit. Hemoglobin was below 10 g/dl in 19.1%. In 1989, 1990, and 1991, 13.1%, 16.4%, and 35.8% of the pregnant women attending government services were tested, and 30.8%, 21.9%, and 20.4% of those tested were found to have hemoglobin below 10 g/dl.

In 1991 pelvic inflammatory disease was diagnosed in 1,453 females attending government clinics, trichomoniasis in 4,892, and cervical cancer in 221. There were 28 female adult AIDS cases reported in 1992. For the period 1982–1992, there have been 135 adult female AIDS cases and 99 deaths, with a case fatality of 74% among all female cases. The first 11 adult female cases were reported in 1987. In 1991, 4.1% of pregnant women tested at antenatal clinics had a positive VDRL test for syphilis, increasing in 1992 to 9.6%.

Health of Special Groups

A nongovernmental organization that carries out research has estimated that there are 850 disabled chil-

dren in five parishes who are enrolled in community-based rehabilitation (CBR) programs and over 500 who are in residential homes. Of these 500, 372 are in the care of the children's services: 45 in hospitals and infirmaries, 108 in specialized homes for the disabled, and 219 in regular children's homes. It is believed that the majority of these children do not need to be institutionalized and would benefit greatly from CBR.

An International Epidemiological Study on Childhood Disability (IESCD) conducted in the parish of Clarendon from 1987 to 1989 investigated the prevalence rate of six types of disabilities in the 2–9-year-old population of 5,461 children and found an estimated frequency of disabilities in children of 9.4%; over 75% of the disabled children were mildly affected. The most common disabilities were mental retardation, speech defect (which was usually secondary to another disability), and vision impairment. Thirty percent of the children had two or more disabilities.

The main causes of childhood disabilities have been identified as problems occurring during pregnancy and birth, genetic disorders, complications of various injuries and infections, and very poor socioeconomic circumstances. The IESCD revealed that the major needs of disabled children were for home-based services (30%), special education (62%), and eyeglasses (22%).

Diseases and Health Impairments

Vector-borne Diseases

During 1992, there were six imported cases of malaria and 296 cases of dengue fever. In the years 1989, 1990, and 1991, respectively, two, zero, and five malaria cases occurred, all imported. Dengue cases reflect an outbreak in 1992. Of the reported dengue cases, 167 were confirmed serologically. The numbers of cases in 1989, 1990, and 1991 were 40, 11, and 5, respectively. These low case numbers probably represent poor reporting. No cases of yellow fever have occurred during the past 5 years.

Vaccine-preventable Diseases

In 1992 there were no cases of diphtheria or pertussis. In 1991 there were 17 cases of whooping cough. No cases of polio were reported in the period 1989–1992. However, six cases of acute flaccid paralysis in persons under 15 years of age were identified and later discarded based on negative stools (five cases) or diagno-

sis of brain abscess (one case). Five cases of tetanus (excluding neonatal), 32 cases of rubella, 11 cases of mumps, and 92 cases of measles were recorded in 1992; 40 of the measles cases were discarded on the basis of clinical information, laboratory studies, and miscodes. Measles cases totaled 5,680 in 1989, 7,707 in 1990, and 317 in 1991. Five cases of congenital rubella were reported in 1991, and none in 1992.

Cholera and Other Intestinal Infectious Diseases

In 1992, no cases of cholera were reported. There were 18,932 cases of gastroenteritis in children under 5 years old and 4,615 cases in persons over 5 years old. Twenty-seven cases of typhoid were reported during 1992.

Foodborne illnesses during 1992 may have been underreported. There were 86 cases notified in 1992 and 281 in 1991, 84% of which were associated with *Salmonella sonnei*. A possible outbreak of fish poisoning (ciguatera) was suspected in 1992; in 1991 there were 96 cases associated with consumption of barracuda.

Chronic Communicable Diseases

In 1992, six Hansen's disease (leprosy) cases were reported, as were 98 cases of tuberculosis. To date there has been no association of tuberculosis with HIV/AIDS patients.

Other Communicable Diseases

In 1992, 740 cases of chicken pox were reported, an increase from 309 cases in 1991, 62 in 1990, and 25 in 1989. Reported cases of viral hepatitis totaled 30, 28, 36, and 35 for 1989, 1990, 1991, and 1992. In 1992, three cases of hepatitis B were reported.

Leptospirosis is the most frequently reported zoonotic disease in Jamaica. Rodents appear to be the main source of infection, although other animals, both domestic and wild, have been identified as carriers. In 1991, 231 human leptospirosis cases were confirmed (compared to 120 in 1990 and 441 in 1989).

AIDS and Other Sexually Transmitted Diseases

In 1992, there were 2,143 cases of secondary syphilis and 11,916 cases of gonorrhoea. In 1991, 5,012 cases of nongonococcal urethritis, 820 cases of chancroid, 173

cases of genital herpes, and 358 cases of genital warts were reported by the Epidemiology Unit, Ministry of Health.

The cumulative number of AIDS patients among all ages up to 1992 was 432, of whom 301 had died. Over three-quarters (77.3%) of the cases were in the age group 10–49 years, and 64.4% were among males. The male to female ratio for adult cases is 1.9:1. For 278 cases the risk factor is known: 76.2%, heterosexual contact; 11.9%, male homosexuality; 9.0%, male bisexuality; 1.4%, blood transfusion; and 1.4%, drug use.

Other Diseases

Screening of 32,424 people in 1991 identified 1,375 new diabetics, or 4.2% of those screened.

About 15,500 blood pressure checks were done in 1991 in various community locations, including supermarkets and company offices. This screening found 33% of those tested to have high blood pressure, and more than half of those identified as hypertensive learned of it for the first time during this screening. A similar screening program which produced electrocardiogram tracings on 6,310 persons found 19.7% to have abnormal rhythms, of which fewer than 4% were previously aware.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

The 1990–1995 draft 5-Year Health Sector Plan continues to guide health care services and strategies. The plan's major points are (a) promotion of good health and nutrition through public education; (b) increased access to care at all levels with effective referral mechanisms for transfers between levels of care, including increased availability of drugs and laboratory and diagnostic services, in collaboration with the private sector; (c) improvement in the quality of care in the public and private sectors; (d) expansion of environmental protection to ensure access to safe food, clean air and water, and safe disposal of household and industrial waste; (e) provision of efficient resource management through decentralization of the services, including the exploration of alternative methods of health care financing; (f) provision of the legal framework to provide the authority required for compliance with new health regulations; and (g) provision of epidemiologic tools and research to

guide the identification and development of priority programs. Other priority activities on which the government has embarked include the establishment of a comprehensive health information system, development of local health systems, improvement of physical infrastructure maintenance, maternal and child health, nutrition, disaster preparedness, veterinary public health (including a strong program on food safety and protection), oral health, and mental health.

The Ministry of Health has continued its implementation strategies for decentralization of the services. These include strengthening of hospital management, continued reorganization of the Ministry's central office, the further development and strengthening of referral services between levels of care, and the training of personnel to manage the system. Consequently, the traditional organization and structure—in which detailed national level direction and management is provided to hospitals and other levels of care—are giving way, albeit slowly, to greater autonomy, responsibility, and authority at four regional-level administrations, and these changes carry through a network of local health systems at the parish level. The current policy is to decentralize by means of an appropriate mix of divestment, privatization, and government services.

The Ministry of Health remains the major provider of health services, but there is a significant private sector component in the delivery of primary care. Collectively, this system provides the nation with coverage of a wide range of preventive, promotive, and curative services and environmental health programs, as well as training of a number of categories of health providers and workers.

Human resource development remains a priority of the Government and the Ministry of Health. There is an ongoing extensive project to rehabilitate a number of health care facilities, at both primary and secondary levels.

Organization of Services

Primary Health Care

While the administrative structure will change as a result of decentralization, the *de facto* delivery of traditional primary health care and basic curative medical care will not change. These services will continue to be available through about 350 government-operated health centers, which are classified and staffed according to their services and their designated catchment area populations.

Attendance and coverage for major primary health care services have varied over the 1987–1991 period. The estimated percentage of pregnant women entering prenatal care in government facilities has declined steadily from 88.8% in 1987 to 65.6% in 1991, as reported by the Ministry of Health. Along with this decline has been a slight decrease, from 20% to 18%, in the proportion of women whose first antenatal visit occurs during the first trimester. The estimated average number of visits per woman per pregnancy has remained steady at about four.

Postnatal services, primarily measured as visits by mothers to health centers at 6 weeks postpartum, were about 65% in 1987 and 67% in 1991. The number of mothers who accept a family planning method at the time of the postnatal visit has remained steady at just over 60%; however, the percentage of babies who are reported at that visit to be solely breast-fed declined from 52.8% in 1987 to 47.0% in 1990. (It must be noted that in 1991 a different computation method for breast-feeding assessment rendered comparisons with previous years invalid.)

Although levels of immunization remain high, they fall short of targets. In 1991 and 1992 they showed marginal national declines of 1%–2% and greater declines in some geographical areas, a fact that is attributed to staff and vaccine shortages. For the period 1989–1992, immunization coverage was highest in 1990. The coverage was lowest for 1992 owing to constraints such as inadequate and erratic supply of vaccine, transportation difficulties, and staff attrition. Innovative measures are being implemented to boost coverage. In 1992, the coverage for children under 1 year old was 85.4% for BCG, 74.2% for OPV, 84% for DPT, and 63.3% for measles. In 1991 the coverages for these vaccines were 94.4%, 85.7%, 84.7%, and 77.1%, respectively.

In 1992 there were 89 nutrition clinics for children with grades II and III malnutrition. The 5,161 children registered were weighed at regular intervals and given supplemental foods, and their caretakers were counseled and exposed to health education.

School-age children (age group 5–14 years) have been a neglected group with respect to special programs. However, public health nurses monitor immunization status and communicable diseases in the school setting. The main emphasis with regard to this group, however, is health education on topics such as personal hygiene, dental health, environmental health, and healthy lifestyles.

Clinical and surgical family planning services are offered in government health centers and at clinics oper-

ated by six nongovernmental organizations. Like those of other primary health care services, indicators of family planning utilization and acceptance declined over the 1987–1991 period. After increases in both the number and the proportion of new users up to 1989, there was a 10% decline in the number of new users in 1990 and a further 11% drop in 1991, while the proportion of total clients who were new users decreased by about 2%. The primary method of birth control is the oral contraceptive pill (42% of new acceptors), followed by injection (25.7%). Hormonal implants were approved as a contraceptive method in 1991 and began to be phased in for selected users in 1992. Routine data on contraceptive prevalence are poor because identification and follow-up of family planning program drop-outs is weak, and because contraceptive pills are widely available for purchase without prescription.

In addition to preventive services, physicians or nurse practitioners based at some government health centers provide curative services. In the 1987–1991 period there was a steady, though small, annual increase in the number of visits made to health centers for curative reasons. Data routinely gathered on curative services count visits, rather than patients, and are limited to 13 predefined diagnoses as well as “other” (which routinely totals more than any other diagnosis); thus, diagnoses made during curative visits cannot be used to calculate either prevalence or incidence of any disease.

Primary health care has accounted for just over 20% of the Ministry of Health’s annual recurrent budget between 1987 and 1991. The 1989–1990 budget marked a high, with 22.5%, while 1988–1989 showed a low, with 19.3%.

No accurate data are available to suggest the magnitude of medical services that may be provided by private doctors, although a national survey of living conditions in 1991 found that approximately 20% of those surveyed reported having attended a public health center. It seems that substantial numbers of the population seek health care in the private sector.

A number of nongovernmental organizations play a role in preventive and promotive health activities. Among them are the Jamaica Cancer Society, the Diabetic Association of Jamaica, and the Health Foundation of Jamaica.

A National Road Safety Committee—comprising representatives of government agencies, NGOs, and private sector agencies—was formed in 1992 with the Prime Minister as chairman. One outcome from this initiative was the introduction of a new traffic ticketing and fine system, effective from April 1993.

Substance abuse is another public health concern. An eight-bed detoxification unit was set up in the psychiatric unit of University Hospital of the West Indies early in 1991. Patients are then transferred from there to one of three rehabilitation centers in Kingston, all of which also accept self-referrals. These centers, Patricia House (supported by the Richmond Fellowship), Addiction Alert (an NGO), and William Chamberlain House (Salvation Army), accommodate 24, 30, and 25 clients, respectively. Patricia House and William Chamberlain House have long-term residential programs of 4–6 months. Addiction Alert has a day-care program that lasts 28 days.

There are two special centers that offer care for HIV-infected persons and those with AIDS. One is attached to the University Hospital of the West Indies and offers medical counseling and social welfare services to clients of all ages and their families. The other, which is operated by an NGO, caters to adult clients and their families.

Secondary and Tertiary Care

The Ministry of Health operates 19 acute-care hospitals and 3 specialized chronic-care facilities. The 5,078 beds (1991) operated by the Government and the University Hospital of the West Indies are supplemented by 312 beds in a half-dozen small private hospitals, including 30 in a private wing of the University Hospital which opened in 1991. Since 1987 the number of government hospital beds has declined by 385 (7%), primarily because of ward closures necessitated by nursing staff shortages.

Hospitals, like health centers, are classified according to the type and level of service they provide. The six type “S” facilities provide referral services in a single specialty, e.g., psychiatry, pediatrics, respiratory diseases, obstetrics and gynecology, rehabilitation of the physically disabled, and care for cancer patients. The two type “A” hospitals are regional general hospitals that provide secondary and tertiary services. These facilities are located in Jamaica’s two largest cities, Kingston in the southeast and Montego Bay in the northwest. Type “B” hospitals are designated regional facilities that provide services in general medicine, surgery, pediatrics, and obstetrics and gynecology. Type “C” hospitals are parish (geopolitical unit) community hospitals that offer general medical care and some minor surgery.

The University Hospital of the West Indies is located in Kingston. This institution receives referrals not only

from Jamaica but from other countries and territories in the subregion.

Hospital management, which in the past had been the responsibility of a team of medical, nursing, and administrative staff, is expected to become more efficient and effective with the appointment of a chief executive officer (CEO) in each hospital, who will be responsible for administrative and managerial oversight of the institution. By early 1993 CEOs had been appointed in five hospitals.

In the 1988–1991 period, efficiency and utilization indicators for Jamaica's government hospitals were as shown in Table 2.

About two-thirds of the Government's national health care budget is routinely devoted to secondary care: 67.4% in 1987–1988, 64% in 1988–1989, 61.4% in 1989–1990, and 61.2% in 1990–1991. In addition, annual budget expenditures for capital purposes are almost entirely consumed by the secondary/tertiary care sector.

In attempts to offset these expenditures, the Ministry of Health has continued to investigate alternative methods to finance medical care. Since 1990 procedures for collecting fees have been implemented or improved, the fee schedule revised, and efforts made to increase the level of collections from insurance companies. In 1992 an estimated 7%–10% of the cost of hospital services was recovered through collection of fees. Many NGOs assist the Government in taking care of the disabled. There is one government school for the deaf, a similar facility for mentally retarded children, and a hospital for the rehabilitation of the physically handicapped. NGOs offer residential facilities, training of the disabled as well as their families, and community workers who assist them in the home. Research on methods for quick assessment of disabilities or developmental delays in children has also been done by NGOs.

Environmental Services

The Ministry of Health shares responsibility for environmental health services with a number of other public, quasi-public, and private agencies. The Public Health Inspectorate is related to the Ministry's primary health care program. Public health inspectors assigned to parish public health departments are responsible for inspections of premises and enforcement of the public health laws.

Vector surveillance and control programs were continued, in particular with regard to keeping the island's two international airports and environs free of the *Aedes aegypti* mosquito, an exercise that was not un-

TABLE 2
Selected indicators for government hospitals,
1988–1991.

| Indicator | Year | | | |
|---------------------------------|---------|---------|---------|---------|
| | 1988 | 1989 | 1990 | 1991 |
| Inpatient discharges | 132,218 | 124,668 | 111,475 | 137,155 |
| Bed occupancy (%) | 79.0 | 77.0 | 67.2 | 71.8 |
| Average length of stay (days) | 7.6 | 6.7 | 7.8 | 6.0 |
| Death rate (per 100 discharges) | 4.6 | 4.6 | 4.1 | 3.9 |
| Emergency room visits | 539,118 | 339,497 | 380,341 | 396,120 |
| Outpatient clinic visits | 377,428 | 389,908 | 401,885 | 377,464 |

dertaken widely elsewhere. Spot surveys in 1991 found *Aedes aegypti* infestation indices ranging from 28% to 57%.

The Ministry of Health serves as a monitor for water quality, working hand-in-hand with the National Water Commission and the few local public water supply providers. During 1991, 76% of 4,090 bacterial analyses of water samples were negative, while 79% of 12,760 samples showed residual chlorine content.

Of the country's urban population, which is about half of the total population, 59% is served by potable-water house connections and another 33% is deemed to have reasonable access to a public standpipe. On the other hand, 48% of the rural population has reasonable access to safe water. Over half (55%) of urban water supplies are chlorinated, while 34% of rural supplies are similarly treated.

In urban areas 89% of the population is served by sanitary sewers or household systems such as septic tanks or pit latrines. In rural areas 59% of the population is served by systems that are recognized as adequate for sanitary disposal.

Pharmaceutical Services

The Pharmaceutical Services Division of the Ministry of Health is charged with acquiring, storing, and distributing all the drugs, vaccines, and other medical supplies that are consumed or prescribed within the government health services.

The Division's efforts were hampered by substantial personnel shortages, an unstable exchange rate, and an inflationary economy, which decimated its already inadequate budget. Ninety percent of Jamaica's pharmaceuticals are imported.

During 1991, over 2 million prescriptions were dispensed to patients at government hospitals and some

of the larger health centers. The health service fee collection system introduced in 1991 includes a flat-rate charge for each item on any prescription filled at a government hospital pharmacy. The fee—about US\$ 0.70 per item—is said to be low enough to allow patients to obtain necessary drugs.

Generic drugs have replaced brand names as much as possible. The government medical services have adopted and subscribe to a “vital, essential, and necessary” (VEN) drugs and medical supplies list.

To help the public combat the high prices of selected pharmaceuticals, the first of five “drug windows” was opened in 1991. This scheme offers a small selection of widely used over-the-counter drugs, prepackaged prescription drugs, and family planning supplies at subsidized prices.

Laboratory Services

Many diagnoses made in the government health/medical services in Jamaica are based only on clinical evaluation because of long-standing problems in the staffing, management, and functioning of the central Government Medical Laboratory.

The Ministry of Health budgets for 1987–1991 have, on average, allotted laboratory services 1.4% of the recurrent expenditures. Costs of consumable supplies and equipment, most of which must be imported, and maintenance of existing equipment and instruments have routinely outstripped the allocated funds. The newly instituted fee collection system includes small charges for most laboratory tests.

Dental Services

The public health dental services, delivered through dental clinics established in some of the larger government health centers, provide preventive and restorative services and minor emergency and palliative services—mostly extractions—for adults. The preventive services include visits to schools and a fluoride application program. The salt fluoridation project begun in 1987, in which all salt manufactured or packaged in Jamaica is fluoridated (as no public water supply is), continues. While the government services cannot find dental surgeons to fill their established posts, the number of dentists in private practice has increased remarkably during the past few years, although the distribution of dentists leaves little or no service available in many rural areas.

Veterinary Public Health

Veterinary public health endeavors involve the Ministry of Health, the Ministry of Agriculture, and a number of other agencies in a cooperative effort to prevent and control zoonoses and to reduce the risk of foodborne disease. Public education and community participation are the two main strategies being employed to improve hygienic food handling and rodent control programs.

Health Promotion

A long-standing policy of the Ministry of Health holds that “emphasis will be given to activities which expand counseling services, promote public education, and stimulate active public participation in all health programs, to increase awareness of healthful practices, and to encourage the people to take responsibilities for the maintenance of their communities.” The practical effect of this policy is that the Ministry itself undertakes educational efforts targeted to audiences in its facilities and also establishes links with other government ministries (particularly Education and Youth and Community Development), with international organizations, with nongovernmental organizations, and with churches in order to deliver its health promotion messages and programs to clients who may not be a captive audience in its health centers.

Available Resources

Human Resources

In 1992, 1,220 physicians were registered to practice in Jamaica. Data are not available on how many of these physicians are actually practicing. In the public sector there are 443 physician posts, of which 407 were filled in 1991 and 397 in 1992.

The number of nurses, as measured by membership in the Nursing Association of Jamaica, a voluntary professional organization, was 1,020 in mid-1993. The Association estimates that this number is 85% of active practicing (both public and private sector) nurses in the country, which suggests that about 1,200 active registered nurses are practicing in Jamaica. In the government service, there are 217 posts for public health nurses (120 filled in 1991 and 125 in 1992); 64 posts for nurse practitioners (59 filled in 1991 and 63 in 1992); 32 for nurse anesthetists (16 filled in 1991 and 25 in 1992); 2,291 for registered nurses (998 filled in 1991 and 887

in 1992); and 548 for midwives (377 filled in 1991 and 340 in 1992).

The Ministry of Health and its departments have over 12,000 personnel, including staff at the Registrar General's Department. Some 59% of Ministry staff are located at hospitals, 30% work in primary health care, and 11% are involved in administration.

Financial Resources

Underfinancing of the health services has adversely affected the Ministry's ability to recruit and to retain suitable staff, as well as its ability to fund new projects

and proposals. Consequently, substantial funding of the services comes from extrabudgetary sources, by way of either loans (concessional or otherwise) or grants from bilateral and multilateral organizations.

In the Government's 1991-1992 recurrent expenditures budget, health was estimated to consume 8.8% of the total, compared to 9.7% in 1990-1991, and 9.6% in 1989-1990. The Ministry of Health is facing the financing difficulties by exploring new strategies, such as the fostering of partnerships with the private sector and the community at large, including nongovernmental organizations, and by constantly reviewing the structural/functional arrangements of the Ministry and its field operations.

MEXICO

GENERAL HEALTH SITUATION AND TRENDS

Mexico has an area of 1,967,183 km², and comprises 31 states and a Federal District, which is the national seat of government. The country encompasses hot and relatively humid regions and vast deserts. The southeastern region, which makes up 15% of the total area, has about 50% of the country's river resources and 12% of the population. In contrast, the central and northern altiplanos make up 47% of the area and account for 60% of the population, but have less than 10% of the river resources.

The 1990 census recorded 81,248,645 inhabitants. The greatest demographic growth occurred between 1950 and 1970, when the population doubled as a result of continually high birth rates and steady declines in mortality rates. Between 1960 and 1970 the growth rate remained stable, at 3.2% per year. The growth rate between censuses (1980–1990) was 2.3% per year. For 1992, the annual growth rate was estimated at 1.9%. The proportion of the population aged under 15 decreased from 43.1% in 1980 to 38.3% in 1990, while that of persons 65 and over rose from 3.8% to 4.2% between those years. The census showed that 7.9% of the population speaks one of Mexico's 68 indigenous languages; 80.8% of that proportion is concentrated in eight states.

In 1940, almost 65% of the population lived in communities with fewer than 2,500 inhabitants (rural environment); by 1990, the proportion had dropped to 28.7%. In early 1990, the Mexico City metropolitan area, which includes the Federal District and 27 *municipios* in the state of Mexico, had a population of more than 15 million—18.2% of the total population. Of the rest of the population, 10.8% lived in five other major cities of more than 1 million inhabitants, 30.7% lived in 282 small and mid-sized cities, and the remaining 40.3% was distributed among more than 120,000 rural settlements with fewer than 15,000 inhabitants. In 1990, the country had slightly more than 16 million private homes, 87.5% of which had electricity, 79.4% had piped water, and 63.6% had sewerage.

Literacy among the population over the age of 15 increased from 74.2% in 1970 to 87.6% in 1990. The total fertility rate declined from 6.8 children per woman of childbearing age in 1968 to 3.8 in 1987 (5.9 in rural areas and 3.0 in urban areas). The rate in 1990 was 2.5 children per woman of childbearing age. Life expectancy at birth in 1990 was estimated at 69.7 years for the population as a whole, which is 10.8 years more than in 1960.

The potential coverage of public and private health services is 94% of the total population. In 1990, 55.6% of the population was covered by social security institutions.

In 1990, 17.4% of the population moved from one state to another. Those who emigrate mainly go to the United States of America, which in 1991 received 946,167 new immigrants from Mexico. Some 50,000 seasonal agricultural workers from Guatemala and other Central American countries come through Mexico's southern border annually. In addition, the number of refugees from those countries living in Mexico in 1993 was estimated at 49,000, and 43,000 were waiting to be repatriated.

Health and Living Conditions

Within the overall crisis that characterized the 1980s, Mexico underwent political and social changes that enabled the country to meet the 1990s experiencing an economic recovery and a lower rate of inflation. Notwithstanding these advances, the crisis years took their toll. The proportion of people living in poverty and extreme poverty rose from 44.9% in 1981 to 59.5% in 1987, and it is estimated that 9 out of every 10 Mexicans born during those years were born into poverty. The distribution of income is uneven; in 1989, the poorest 10% of the population received only 1.6% of the total income produced, whereas the wealthiest 10% amassed 37.9% of the wealth. In 1990, the open unemployment rate was 2.7%, and the external debt had reached US\$ 78,300 million.

Low-income persons are found throughout the country, but very many are known to live in rural en-

vironments. Indigenous peoples, migrant workers, and small landowners form the core of the impoverished rural population. Poverty affects women and children more than any other population group. The population segment that lives in extreme poverty is located in hard-to-reach mountainous areas, jungle regions, and desert zones. The major cities attract migrants from rural areas, exacerbating poverty in some areas.

In 1987, the *municipios* of the 32 federative entities were classified by degree of impoverishment, according to income levels, living conditions, availability of basic services, educational levels, parity, and migration (Table 1). The inhabitants of *municipios* with high or extremely high degrees of impoverishment represented 34% of the total population.

For the group of *municipios* classified as having an extremely high degree of impoverishment, the general mortality rate was 10% higher than the national average, while for the group with a low degree of impoverishment, it was 4% lower. The 10 states with the highest levels of impoverishment had higher estimated infant mortality rates than the national rate; in 9 of them, the total fertility rate was higher than the national average, and in 6, maternal mortality was higher than the national figure. The states with low degrees of impoverishment had lower rates than the national rates. Life expectancy at birth in the states with high degrees of impoverishment was up to 7 years lower than the national figure, whereas in the states with low degrees of impoverishment it was up to 4 years higher. The lowest life expectancy figure (62.1 years) was found in Oaxaca, a state with a high degree of impoverishment. The highest (74.1 years) was in Nuevo León, which has a low degree of impoverishment.

In late 1992, negotiations were concluded for a free trade pact among Mexico, the United States, and Canada, which is expected to open markets and create productive employment that will benefit the most deprived groups. The agreement includes provisions relating to environmental protection, health in general, and workers' health in particular.

Coverage and Timeliness of Health Information

Registration of vital statistics has improved substantially since the mid-1980s, but in remote rural areas there continues to be underregistration of deaths among the population under 5 years old and for ma-

ternal mortality causes. Registration is virtually complete in the Federal District and in some northern states. Overall, underregistration of infant mortality is estimated at 30%. There are marked variations among states: in two of them, underregistration is estimated at 80%, whereas in another four the registered rates of infant mortality are 12%–36% higher than the rates estimated by indirect methods, presumably because they take into account deaths of children who come from other states. Underregistration of infant mortality influences the calculation of life expectancy, causing the life expectancy computed for some states with high degrees of impoverishment to be higher than the national average. Medical certification is issued for 94.9% of deaths overall, with the proportion ranging from 78.6% in states with high levels of impoverishment to 99.8% in states with low levels.

Since 1988, the National Epidemiologic Surveillance System has compiled information supplied in a uniform and timely manner by all the country's medical units. The information is most complete and current for those diseases that are targeted by control or eradication programs. In rural communities that have no doctor, health workers or traditional birth attendants report symptoms and signs of disease to the Simplified Epidemiologic Surveillance System, which operates in 11 states. The National Health Survey System, created in 1987, periodically gathers information on specific diseases at the national and regional levels. A national cancer registry was established in 1982, but is not yet in operation.

Mortality

General mortality has declined markedly since the turn of the century. In 1900, the rate was estimated at 33.6 deaths per 1,000 population; by 1950 it had decreased by half, and by 1960 it had dropped to one-third of the 1900 level. In 1980, when it had fallen to one-fifth, the decline began to slow. In 1991 the rate was 4.8. The crude death rates registered in 1990 ranged from 6.7 deaths per 1,000 population in Oaxaca, a state with a high degree of impoverishment, to 3.2 in Quintana Roo, which has a low degree of impoverishment.

Over the last three decades the decline in mortality has been more pronounced among the groups aged 1–4 and 5–14 than in the under-1 age group and all other age groups. The infant mortality rate fell 50% between 1960 and 1989, while mortality among children aged 1–4 dropped 76% and mortality among children 5–14 years old went down 66%. The decreases in mor-

TABLE 1
Degree of impoverishment, total population, estimated and registered infant mortality rate, fertility rate, maternal mortality rate, and life expectancy at birth, by federative entity, Mexico, 1990.

| Federative entity | Degree of impoverishment ^a | Total population ^b | Estimated infant mortality ^c | Registered infant mortality ^c | Fertility ^d | Maternal mortality ^e | Life expectancy |
|-----------------------|---------------------------------------|-------------------------------|---|--|------------------------|---------------------------------|-----------------|
| Country as a whole | | 81,250 | 34.8 | 24.1 | 3.2 | 5.4 | 69.7 |
| Oaxaca | 3 | 3,020 | 47.7 | 23.5 | 4.0 | 12.0 | 62.1 |
| Chiapas | 3 | 3,210 | 26.5 | 16.4 | 3.7 | 0.8 | 66.4 |
| Guerrero | 3 | 2,621 | 45.6 | 8.1 | 4.2 | 6.3 | 67.4 |
| Hidalgo | 3 | 1,888 | 43.0 | 21.8 | 3.8 | 6.5 | 66.0 |
| Tabasco | 3 | 1,512 | 32.5 | 25.7 | 3.6 | 2.8 | 67.6 |
| Zacatecas | 3 | 1,276 | 44.1 | 21.1 | 3.6 | 3.6 | 71.3 |
| Veracruz | 3 | 6,228 | 38.4 | 20.5 | 3.0 | 7.5 | 69.3 |
| San Luis, Potosí | 3 | 2,003 | 40.6 | 22.9 | 4.0 | 6.1 | 70.8 |
| Puebla | 3 | 4,126 | 41.0 | 36.7 | 4.0 | 8.2 | 65.9 |
| Michoacán | 3 | 3,548 | 41.4 | 18.0 | 4.2 | 3.1 | 68.7 |
| Querétaro | 2 | 1,051 | 40.0 | 33.8 | 3.7 | 5.7 | 68.3 |
| Quintana Roo | 2 | 493 | 30.9 | 22.3 | 2.7 | 2.6 | 71.3 |
| Nayarit | 2 | 825 | 34.3 | 12.1 | 3.1 | 3.2 | 72.2 |
| Tlaxcala | 2 | 761 | 35.0 | 39.1 | 3.8 | 8.4 | 68.6 |
| Yucatán | 2 | 1,363 | 35.8 | 23.8 | 2.8 | 5.3 | 70.7 |
| Sinaloa | 2 | 2,204 | 34.5 | 8.0 | 3.5 | 1.5 | 71.9 |
| Campeche | 2 | 535 | 33.9 | 21.8 | 2.9 | 3.9 | 71.8 |
| Guanajuato | 2 | 3,983 | 41.1 | 36.6 | 3.3 | 6.4 | 69.3 |
| Durango | 2 | 1,349 | 38.8 | 7.1 | 3.9 | 4.3 | 71.3 |
| Morelos | 2 | 1,195 | 31.3 | 22.1 | 3.1 | 5.9 | 70.6 |
| Colima | 2 | 429 | 28.1 | 25.3 | 2.7 | 5.8 | 69.4 |
| Chihuahua | 2 | 2,442 | 31.1 | 26.6 | 2.4 | 3.0 | 69.8 |
| Tamaulipas | 2 | 2,250 | 24.5 | 16.7 | 2.7 | 1.8 | 71.4 |
| Baja California Sur | 2 | 318 | 24.9 | 20.2 | 3.0 | 2.1 | 71.4 |
| Jalisco | 2 | 5,303 | 32.6 | 24.1 | 3.1 | 3.8 | 70.9 |
| Sonora | 2 | 1,824 | 27.3 | 21.4 | 2.5 | 2.1 | 70.2 |
| Coahuila | 2 | 1,972 | 47.9 | 16.3 | 2.9 | 4.8 | 71.4 |
| Aguascalientes | 1 | 720 | 32.5 | 28.7 | 3.2 | 1.7 | 71.2 |
| México | 1 | 9,816 | 29.5 | 37.1 | 2.2 | 7.4 | 70.1 |
| Baja California Norte | 1 | 1,661 | 21.1 | 28.9 | 2.3 | 3.4 | 70.8 |
| Nuevo León | 1 | 3,099 | 22.3 | 17.4 | 2.4 | 2.3 | 74.1 |
| Federal District | 1 | 8,236 | 19.9 | 23.6 | 2.2 | 5.0 | 73.2 |

^a3 = high, 2 = medium, 1 = low.

^bIn thousands of inhabitants.

^cRate per 1,000 live births.

^dNumber of children per woman of childbearing age; figures are for 1988.

^eRate per 10,000 registered live births.

^fEstimates based on registered deaths.

Sources: National Institute for Statistics, Geography, and Information Processing (INEGI). XI General Census of Population and Housing 1990. Mexico, 1992. CONAPO. Index and degree of impoverishment. Mexico, 1988. National Commission for Monitoring and Evaluation of the National Program of Action. Mexico and the World Summit for Children. First Evaluation. Mexico, 1992. Secretariat of Health. Division of Statistics, Information Processing, and Evaluation. Mortality 1990. Mexico, 1992.

tality in the 15–44, 45–64, and 65-and-over age groups were 41%, 33%, 13%, respectively.

Death rates among males remained consistently higher than those for females in all groups, except the

1–4 age group, and the decline in mortality was less marked among males than among females. Among females, the biggest drop was in the group aged 15–44 owing to lower maternal mortality. In 1991, the general

mortality rate was 415.7 per 100,000 for females and 545.3 for males, which represents a 32% excess male mortality.

In terms of major groups of causes, mortality from communicable diseases decreased between 60% and 87% in all age groups during the last three decades, which largely explains the decline in overall mortality. Mortality from malignant neoplasms increased among infants, preschoolers, and schoolchildren, but remained relatively stable for the other age groups. Mortality from external causes increased among children under 1 and among those over 15.

In 1991, the leading causes of death in the general population were heart disease (ICD-9, 390-429), at a rate of 63.4 deaths per 100,000 population (13.5% of deaths from defined causes); malignant neoplasms (140-208), at 49.2 (10.4%); accidents (E800-E949), at 45.7 (9.7%); diabetes mellitus (250), at 31.8 (6.7%); certain conditions originating in the perinatal period (760-779), at 26.2 (5.6%); cerebrovascular disease (430-438), at 24.4 (5.2%); pneumonia and influenza (480-487), at 22.7 (4.8%); intestinal infectious diseases (001-009), at 22.0 (4.7%); chronic liver disease and cirrhosis (571), at 21.8 (4.6%); and homicide and injury purposely inflicted by other persons (E960-E969), at 17.7 (3.8%). These 10 causes accounted for 68.2% of all deaths from defined causes. In 1988, malignant neoplasms shifted from third to second rank, displacing accidents, while diabetes moved from fifth to fourth place. In relation to mortality patterns of the 1970s, the group of chronic and degenerative diseases displaced communicable diseases as a cause of death among adults, but not among children.

In 1991, heart disease (390-429) was the leading cause of death among females, at a rate of 62.8 per 100,000, followed by malignant neoplasms (140-208), at 52.2; diabetes mellitus (250), at 35.6; cerebrovascular disease (430-438), at 26.0; and certain conditions originating in the perinatal period (760-779), at 21.4. Accidents (E800-E949) ranked eighth, at 20.7. Among males, the leading cause of death was accidents (E800-E949), at a rate of 70.3 per 100,000, followed by heart disease (390-429), at 63.9; malignant neoplasms (140-208), at 46.1; chronic liver disease and cirrhosis (571), at 34.1; and homicide and injury purposely inflicted by other persons (E960-E969), at 31.6.

In 1990, conditions originating in the perinatal period were responsible for the largest number of years of potential life lost (YPLL) between birth and the attainment of life expectancy (1.6 million years), followed by accidents (1.4 million), intestinal infectious diseases (1.1 million), and pneumonia and influenza

(0.9 million). These causes are more frequent at earlier ages than homicide and chronic noncommunicable diseases, problems which are responsible for fewer years of potential life lost (Table 2).

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

The registered death rate among children under 1 decreased from 39.9 deaths per 1,000 live births in 1980 to 24.1 in 1990. In 1991, the rate was 20.7. In 1991, conditions originating in the perinatal period (760-779) caused 39.2% of all deaths in this group, followed by intestinal infectious diseases (001-009), which accounted for 13.4% of the total; pneumonia and influenza (480-487) caused 12.9%; and congenital anomalies (740-759), 12.0%.

The mortality rate among children aged 1-4 decreased from 340 deaths per 100,000 in 1980 to 243 in 1990. In 1991, the rate was 160.5. The leading causes of death among preschool children in 1990 were intestinal infectious diseases (001-009), at a rate of 49.9 per 100,000 population of this age group; measles (055), at 34.0; accidents (E800-E949), at 29.6; pneumonia and influenza (480-487), at 29.1; and nutritional deficiencies (260-269), at 15.2. The highest death rates among preschool children occur in the most impoverished states.

Among children aged 5-14, the mortality rate was 83.3 per 100,000 in 1980, 57.1 in 1990, and 46.9 in 1991. Accidents cause 34.7% of the deaths in this group, malignant neoplasms cause 9.1%, and intestinal infectious diseases account for 7.5%.

Adolescent and Adult Health

Persons aged 15-64 make up 57.5% of the total population. In 1991, most leading causes of death fell into the categories of chronic noncommunicable diseases or accidents. Only 2 of the 10 leading causes were infectious conditions: intestinal infectious diseases (001-009) and pulmonary tuberculosis (011), which ranked 9th and 10th, respectively. AIDS was in 12th place. The five leading causes were accidents (E800-E949), at a rate of 50.8 per 100,000 population aged 15-64; malignant neoplasms (140-208), at 37.4; heart disease (390-429), at 29.6; chronic liver disease

TABLE 2
Years of potential life lost (YPLL) from the 10 leading causes of death, Mexico, 1990.

| Cause | ICD-9 code | YPLL | Average age at death |
|--|------------|------------|----------------------|
| Total | 001-999 | 10,629,198 | 31.0 |
| Certain conditions originating in the perinatal period | 760-779 | 1,602,878 | 0.5 |
| Accidents | E800-E949 | 1,378,278 | 29.3 |
| Intestinal infectious diseases | 001-009 | 1,102,022 | 9.2 |
| Pneumonia and influenza | 480-487 | 884,105 | 12.0 |
| Homicide and injury purposely inflicted by other persons | E960-E969 | 508,128 | 32.4 |
| Malignant neoplasms | 140-208 | 491,176 | 49.8 |
| Chronic liver disease and cirrhosis | 571 | 285,744 | 50.1 |
| Diabetes mellitus | 250 | 183,280 | 56.9 |
| Heart disease | 390-429 | 125,626 | 60.0 |
| Cerebrovascular disease | 430-438 | 119,654 | 53.0 |

Source: Secretariat of Health. Division of Statistics, Information Processing and Evaluation. Mortality 1990. Mexico, 1992.

and cirrhosis (571), at 26.6; and homicide and injury purposely inflicted by other persons (E960-E969), at 26.0. In 1991, the ranking of causes of death varied considerably among age groups. Accidents were the leading cause in the groups aged 15-24, 25-34, and 35-44, which show rates of 42.6, 49.7, and 53.0 per 100,000, respectively. After age 45, accidents were a less frequent cause of death, ranking fourth for the group aged 45-54, fifth for the group 55-64, and eighth in the group aged 65 and over. Nevertheless, the rates of accidental death were higher—60.1, 75.8, and 179.0 per 100,000 population in the 45-54, 55-64, and 65-and-over age groups, respectively. Malignant neoplasms were the third leading cause of death for the groups aged 15-24, 25-34, and 35-44; the first leading cause for the group aged 45-64; and the second leading cause for those 65 and older. The rates increased with age from 6.2 per 100,000 among the group aged 15-24 to 214.4 among those 55-64. Mortality from heart disease showed the greatest rise with age, climbing from fifth place for the group aged 15-44 to third for the group 45-54, to second for those 55-64, and finally to first place for the population aged 65 and older, among whom the rate is 1,173.4 per 100,000.

Mortality patterns differ markedly between the sexes. In 1991, in the group aged 15-64 the male/female mortality ratio was 1.9:1. The three leading causes of death among males in this age group are accidents, homicide, and cirrhosis, whereas among females they are malignant neoplasms, heart disease, and diabetes mellitus. The National Health Survey conducted in 1987 found that the prevalence of chronic and disabling diseases was higher among females

(9.2%) than males (5.8%), and these diseases increased significantly after the age of 35. Utilization of health services, both outpatient and inpatient, is greater among women. The most conspicuous sex differences are observed in the groups 15-29 and 30-49; this is attributable to the demand for services during pregnancy and for family planning.

Tuberculosis is frequent among adults in all regions of the country. The disease has shown a downward trend among young adults, but the incidence rates rise steadily with age.

Normal delivery and direct obstetric causes are the two leading causes associated with hospital discharge, followed by injury and poisoning, abortion, and diseases of the urinary system. An increase in hospitalizations due to diabetes has been observed.

Health of Women

In 1990, women made up 50.8% of the population. Up to the age of 44 the proportion of males and females in the population is virtually equal, but at age 45 and older, the proportion of females is 51.2%, and it reaches 57.9% in the population aged 75 and over. In 1990, women constituted approximately 35% of the economically active population in the major cities. The service sector employs the largest number of women, and the primary sector the fewest. Most employed women hold low-paying jobs that carry little responsibility. Female enrollment in preschool, primary school, and secondary school is slightly lower than male enrollment, but at the high school and university levels it

is much higher. Women make up 65% of the enrollment in job-training programs, primarily in commercial and secretarial careers.

The registered maternal mortality rate decreased from 9.4 per 10,000 live births in 1980 to 5.1 in 1991, when five maternal deaths of girls aged 10–14 were recorded. Real maternal mortality is higher, as under-registration, incorrect reporting of causes of death, and coding errors are known to exist. A study of deaths of women aged 12–49 in the Federal District (1988–1989) found a maternal mortality rate of 11.4 deaths per 10,000 live births—double the rate indicated by registered vital statistics. Direct obstetric causes are the leading cause of maternal mortality. Toxemia accounts for 25.1% of maternal deaths; complications of the puerperium, for 23.1%; obstructed labor, for 10.1%; and abortion, for 6.6%.

Young women are at risk for accidents, sexually transmitted diseases, unwanted pregnancies, and high-risk pregnancies; the latter problem is exacerbated by malnutrition. In 1989, of all the pregnant women under 15 years old who received care at social security establishments, 31.1% had obstructed labor or complications during childbirth, 7.1% had abortions, and 6.2% gave birth prematurely. Among women in the group aged 15–24, 64.8% had some type of complication during pregnancy.

The majority of victims of rape by a family member are adolescent and young adult women, and the majority of reports of abuse by a spouse or male partner involve women aged 20–29. Elderly women frequently report psychological abuse.

Among the most frequent reasons that cause women to seek attention from the program to assist the disabled, facial paralysis ranked first in the group aged 12–19, followed by posture defects and painful syndromes; in the group aged 20–49 the last cause accounted for 40% of the demand, followed by facial paralysis, fractures and their sequelae, and injuries. Among the female population aged 50 and over, the first two reasons are the same as for the 20–49 age group, but the frequency of osteoarthroses, rheumatoid arthritis, and other joint disorders is notable. Demand for rehabilitation services rises with age.

In 1989, the country's social security institutions reported 3.0 occupational accidents per 100 female workers and 1.5 occupational diseases per 1,000 female workers. Among the accident victims, 19.5% were engaged in general unskilled labor, 8.1% had cleaning jobs, and 7.2% worked in nursing. Skin problems made up 66.6% of the occupational diseases, hypoacusis, 4.3%, and bronchitis, 2.6%.

Health of the Elderly

In 1990, persons aged 60 or older represented 6.1% of the population; most were poor, and only 20% were covered by some social security system. It is estimated that some 2.6 million elderly persons have no institutional health care coverage whatsoever. Of the elderly living in precarious conditions, most are women, owing to their longer life expectancy.

Heart disease, malignant neoplasms, diabetes mellitus, and cerebrovascular diseases are the predominant causes of death in this age group, although acute and chronic pulmonary infectious diseases are also important and together with malnutrition are among the 10 leading causes of death. Death rates from the two leading causes do not differ much between the sexes, but mortality from accidents and cirrhosis of the liver is substantially higher among men, while mortality from diabetes mellitus is higher among women.

The most frequent reasons for seeking medical attention in this age group are arterial hypertension, diabetes, heart disease, lung disease, malnutrition, tuberculosis, and sensory deficiencies. Of the total elderly population, 1% suffers from some disability, the most frequent ones being joint disease, disabilities resulting from injury, and blindness; 6% of those aged 60 or older are partially dependent and 2% are totally dependent on others to carry out everyday activities. Of the population of octogenarians and nonagenarians, 40% suffers from at least one disability, generally related to motor function.

At the National Nutrition Institute, elderly patients occupy 30% of the hospital beds, with an average stay of 21 days. At establishments of the Social Security and Services Institute for Government Employees (ISSSTE), one out of every three beds is occupied by a person from this age group.

Workers' Health

The economically active population represents 29.4% of the total population. There are 500,000 estimated underemployed persons. The most frequent occupational illnesses are work-related chronic bronchitis, pneumoconiosis, and otopathies, which occur mainly in the textile, metalworking, rubber, and mining industries. Occupational accidents, especially falls and injuries caused by improper lifting, are important causes of morbidity, generating close to 526,000 cases in 1991. That same year there were 95,000 commuting accidents.

Health of Special Groups

It is estimated that 7% of the total population has some degree or type of disability. Of that group, 35% is of working age. The 10 most common types of disabilities are joint diseases, epilepsy, blindness, Down's syndrome, hemiplegia, congenital anomalies, mutism, sequelae of poliomyelitis, mental deficiencies, and deafness.

Among indigenous peoples, over 80% of the reported cases of notifiable diseases in 1991 were infectious; 59.8% were acute respiratory infections and 31.8% were intestinal infectious diseases. Children under 5 were most affected. These cases were reported to the National Epidemiologic Surveillance System from 542 municipalities where at least 40% of the population speaks indigenous languages. Those municipalities have more than 4 million persons who fit that category, and represent 62.9% of the total indigenous population in Mexico.

In 1990, the recorded death rate among indigenous peoples was 5.8 per 1,000 population—a figure that is 10% higher than the national figure. The five leading causes of death among the indigenous populations in the above-mentioned 542 municipalities were intestinal infectious diseases, heart disease, accidents, influenza and pneumonia, and measles. In contrast, no communicable diseases are among the first five causes of death at the national level. Nutritional deficiencies rank 6th as a cause of death among indigenous peoples, but are in 12th place at the national level; pulmonary tuberculosis ranks 11th, as compared to 16th; and anemia ranks 13th, as compared to 17th at the national level.

Diseases and Health Impairments

The incidence of communicable diseases varies from state to state and is higher in states with adverse socioeconomic and environmental conditions. In 1991, the Simplified Epidemiologic Surveillance System reported some 50,000 new cases of disease; slightly over 75% were cases of diarrheal disease and acute respiratory infection.

Vector-borne Diseases

The population residing in malarious areas is estimated at 43.5 million persons, and is distributed across 1.2 million km²; these figures represent almost 50% of

the total population and land area of the country. The annual parasite index decreased from 2.9 per 1,000 population in the malarious areas in 1988 to 0.4 in 1992, while the slide positivity rate declined from 8.4 to 1.0 and the annual blood-slide examination rate (percentage of examinations among the population of the malarious area) remained at around 3.5%. During that period the number of positive localities dropped from 17,233 to 5,622. Malaria occurs mainly in rural environments and rarely in suburban areas. Five states account for 60% of the cases. Along the Pacific coast the principal vector is *Anopheles pseudopunctipennis*, while around the Gulf of Mexico and in the Caribbean region *Anopheles albimanus* predominates.

Dengue has been endemic since 1979. Since the epidemic peak in 1980, when 51,406 cases occurred, the incidence has ranged between 10,526 and 32,640. In 1992, a total of 11,878 cases were reported. Serotype 1 predominates, but in 1983 serotype 2 was isolated and in 1984, serotype 4. All three serotypes were detected in 1987 and 1992. Cases of hemorrhagic dengue are rare and isolated; between 1983 and 1992 only five cases were reported. The vector *Aedes aegypti* is found in two-thirds of the country, including places located at more than 1,500 m above sea level, where several outbreaks have occurred.

Regarding Chagas' disease, at least 32 species of *Trypanosoma cruzi* vector have been identified, 25 of which belong to the genus *Triatoma*. Reporting of cases is very erratic. A national epidemiologic survey estimated a seropositivity level of between 3% and 21% among rural populations, with higher prevalences in the southern states. Seropositivity among blood donors ranges from 2.0% to 16.5%.

The largest focus of leishmaniasis is located in the southeastern part of the country (isthmus of Tehuantepec) and stretches to the Yucatán peninsula and Central America. There are five smaller foci. *Leishmania mexicana* is the most widespread species, but *L. braziliensis* also has been found in a focus in the southeast. There are no reliable estimates of the frequency of leishmaniasis, but it is known that the most commonly diagnosed form is cutaneous leishmaniasis, followed by the mucocutaneous form and the diffuse cutaneous form. Kala-azar is rare, with only 115 cases reported between 1952 and 1992.

Since 1950, the average annual number of onchocerciasis cases reported has been approximately 17,000. In 1992, 23,421 cases were reported and 105 cases of blindness were detected. There are three endemic foci; the largest is located along the border with Guatemala and has a population at risk of 190,000.

Vaccine-preventable Diseases

Between 1966 and 1990 a cumulative total of 202 poliomyelitis cases were reported, with outbreaks in three states. In 1990 the last seven cases were reported and the last confirmed case was detected.

Following the regional pandemic of 1989–1990, the number of measles cases dropped substantially. In 1990, a total of 84,008 cases were reported, for a rate of 103.5 per 100,000 population, a figure higher than any recorded in the previous 20 years. Of the reported cases in 1990, 68,782 were confirmed (for a rate of 80.2 per 100,000). The most severely affected groups were unvaccinated children under 1 and over 5 years of age. In 1992, only 735 cases were confirmed, for a rate of 0.9 per 100,000.

In recent years, only a few isolated diphtheria outbreaks and cases have been recorded, mainly along the Pacific coast. In the most recent outbreaks, cases were observed in adolescents and young adults. From 1982 to 1984 no cases were reported. Between 1985 and 1989, a total of 71 were reported, for a rate of 0.01 per 100,000 population for 1989. In 1990, no cases were reported. The last known case was detected in 1991.

The number of reported cases of whooping cough declined substantially, although there continue to be problems with diagnosis of the disease. In 1990 the morbidity rate from whooping cough was 1.4 per 100,000 population.

Since 1988 a distinction has been made between adult tetanus and neonatal tetanus, and in that year, 108 cases of the neonatal form were recorded. There are indications that the disease is significantly under-reported. In 1992, a total of 130 cases were reported, with a morbidity rate of 5.8 per 100,000 registered live births.

Cholera and Other Intestinal Infectious Diseases

The country's first cholera cases were reported in June 1991. Several outbreaks have occurred, especially in rural areas. As of December 1992, the number of laboratory-confirmed cases totaled 10,852, and most occurred among the population that lacks piped water services. The case-fatality rate was 1.2%, and 25% of those affected were hospitalized.

Mortality from diarrheal diseases decreased from 61.6 per 100,000 population in 1980 to 22.0 in 1991. Among children under 5, the rate fell from 279.9 to 103.7 per 100,000 population in that age group. Deaths from diarrhea decreased from 71.8% of all deaths in this age group in 1980 to 57.9% in 1991.

Chronic Communicable Diseases

Between 1988 and 1991 some 15,300 cases of tuberculosis were reported. Of the pulmonary cases, 25% were confirmed through sputum smear examinations and 1% through culture. In 1990, there were 6,202 registered deaths from tuberculosis (7.6 per 100,000 population). Of these, 5,436 were deaths from pulmonary tuberculosis (6.7 per 100,000). Tuberculosis mortality ranges from 3.4 in the Federal District, where the level of impoverishment is low, to 16.9 in Chiapas, which has a high degree of impoverishment. Among the group aged 15–64, the rate was 7.0, and tuberculosis accounted for 60% of all deaths, while among children under 1, the rate was 2.9 per 100,000 registered live births; the disease accounted for 1.4% of all deaths. Meningeal tuberculosis and tuberculosis of the nervous system caused 246 deaths, for a rate of 0.3 per 100,000. An estimated 10% of tuberculosis cases are associated with AIDS, although no increase in reporting of cases attributable to AIDS has been noted.

Since 1960 the prevalence of leprosy has remained at around 17,000 cases, including 2,860 under post-treatment surveillance. Of the approximately 14,000 patients under treatment, 44% are receiving single-drug therapy and 17% show some degree of disability. Almost one-fourth (23%) of the cases occur among the population under 15 years of age; 80% of the endemic foci are located in 10 Pacific states, with the endemic area stretching into the central highland plateau. In 1992, the rates ranged from 1.0 to 10.9 per 10,000; 80% of the cases were multibacillary. As of July 1993, the number of patients had fallen to 10,815, of whom 6,187 were receiving multidrug therapy.

Respiratory Diseases

In 1991, the rate of acute respiratory infection was 13,731.9 per 100,000 population. Mortality from such infections, including pneumonia and influenza, has tended to decline. In 1950, the death rate was 308.3 per 100,000; by 1980 it had fallen to 61.2; and in 1991 it was 26.0. One-half of all deaths from acute respiratory infections occur among children under 5; in 1990, this cause accounted for 19.5% of the deaths in this age group, but in 1991 it represented only 13.2%.

AIDS and Other Sexually Transmitted Diseases

The first AIDS case was reported in 1981. The number of reported cases totaled 2,880 in 1990, 2,388 in

1991, and 3,219 in 1992, for a cumulative total of 13,377 as of 31 December 1992. However, there are known reporting delays, and the true number of cases is estimated at 18,682. The number rose slowly between 1983 and 1986, and then grew exponentially between 1987 and 1990. Since 1991 the spread of the disease has slowed somewhat, although there are regional variations: in the major cities the epidemic has stabilized, but it has continued to spread in rural areas.

Sexual transmission has accounted for 80.7% of the cases detected to date. Of those affected, 34.2% have been homosexual men; 23.8%, bisexual men and women; and 22.7%, heterosexuals. The infection is spreading more rapidly among heterosexual men than among homosexuals and bisexuals. Infected blood and blood products have accounted for 18.2% of the cases; transmission by this route is tending to decline. The remaining 1.2% of cases have occurred among homosexual drug addicts. To date, 383 cases have been registered among pediatric patients: 51.2% were infected through perinatal transmission, 28.2% through blood or blood products, 18.6% were hemophiliacs, and 2% contracted the infection through sexual abuse. As of November 1992, 49.2% of the reported AIDS patients had died, 43.2% were still alive, and the status of the remaining 7.5% was unknown.

In 1987 there were 6,687 recorded cases of syphilis, for a rate of 8.5 per 100,000 population; information for 1992 indicates only 1,924 cases. Mortality from this cause decreased from 0.8 deaths per 100,000 population in 1972 to 0.1 in 1984, and the rate has remained stable since the latter year. In 1987, reported cases of gonorrhea totaled 28,125. In 1992, 14,113 cases of gonococcal infections, including gonorrhea, were reported. In 1991 the incidence of urogenital trichomoniasis was 589.8 per 100,000.

Rabies, Foot-and-Mouth Disease, and Other Zoonoses

More than 100,000 people a year seek preventive treatment after being attacked by dogs, cats, or vampire bats. There were 69 human cases of rabies in 1990, 48 in 1991, and 35 in 1992. Ten states and the Federal District accounted for 78% of the animal cases of rabies and 86% of the human cases.

The country remains free of foot-and-mouth disease, and following several years of control efforts, Venezuelan equine encephalitis was eradicated in 1992. Activities for the eradication of bovine tuberculosis have been stepped up along the border with the United States. In some states, classical swine fever, fowl salmonellosis, and Newcastle disease have been

eradicated. Africanized bees have been present in the country since 1986; as of 1992, 137 people had died as a result of being stung by these insects.

Taeniasis-cysticercosis is acknowledged to be a public health problem in Mexico, despite the fact that there is considerable underreporting and only symptomatic cases are reported. About 3.4% of the autopsies performed in specialized and general hospitals throughout the country reveal cysticercosis involving the central nervous system.

Between 1986 and 1991, a total of 186 *Brucella* strains were isolated from human samples; 97.8% were *B. melitensis*.

Nutritional Diseases and Deficiencies

As measured by the weight-for-age indicator, 41.9% of the population under 5 years of age suffered from malnutrition in 1988; 8.8% weighed under 70% of the mean weight-for-age and showed severe malnutrition. Using $\pm 2SD$ from the weight-for-age indicator as a cut-off point, 14.4% of the children were malnourished and 9.4% were overweight or obese. The height-for-age indicator revealed 15.8% growth retardation. Malnutrition was found to be most widespread in the southern and central regions, where the states with the highest degrees of impoverishment are located. In these areas the prevalence of malnutrition was estimated to be 30.6% higher than the national prevalence. The lowest prevalence was found in the northern region and in Mexico City, which show low degrees of impoverishment. Malnutrition was 131.8% more prevalent in rural areas than in urban areas. The prevalence of low birthweight (under 2,500 g) is estimated at 6.5%.

Among the population aged 12–49, the body mass index revealed 10.4% overweight, 15.0% obesity, and 29.0% underweight. Obesity is becoming increasingly frequent, especially among the adolescent and adult populations.

In rural areas, 31% of women of childbearing age were suffering from malnutrition in 1986; the proportion had diminished to 21% in 1990.

Iodine is supplied through table salt. Endemic goiter has been reduced considerably since 1973, although it persists as a public health problem in some places.

Cardiovascular Diseases

Heart disease has been the leading cause of death in Mexico since 1988. The relative importance of this

cause has increased, and by 1990 heart disease accounted for 14.1% of all deaths. In the country's northern region, where impoverishment levels range from low to moderate, the rates are higher than the national level, and increased 17% in the last decade. In the south, which has high degrees of impoverishment and shows the lowest rates of heart disease, the increase was 27%. Urban areas account for 59.4% of the deaths from this cause. Mortality rises significantly with age. Of the deaths attributed to heart disease, 57% are from ischemia, 93% are of persons older than 45, and the majority are of males (56% as compared to 44% among females). In 1991, cerebrovascular disease ranked sixth as a cause of death. Estimated mortality from hypertension is 8.1 per 100,000, and the rate increases markedly with age; 59% of those who die from hypertension are women. In 1990, rheumatic fever caused 2.1 deaths per 100,000, with higher rates among males than among females (2.7 and 1.5, respectively). Diseases of pulmonary circulation, including cardiac dysrhythmias, are also frequent causes of death. Altogether the cardiovascular diseases are responsible for 335,703 years of potential life lost. In 1992, it was estimated that 21.7% of the population aged 20–69 suffered from hypertension, 1.0% had survived a heart attack, and 0.6% had survived a cerebrovascular accident. Significantly, one-fourth of the adult population is overweight or obese.

Malignant Neoplasms

In 1988, females accounted for 63% of all reported malignant neoplasms, with a high prevalence of cancer of the uterine cervix and breast. The frequency of cervical cancer rises with age: only 0.9% of the cases reported in 1988 involved women under 15; the highest percentage (25%) was among women aged 35–44, and this was the most frequent type of cancer in women over the age of 25. A similar pattern was found for breast cancer. The highest rates of lung, stomach, and colon cancer occurred in the oldest age groups. In 1984, malignant neoplasms ranked fourth as a cause of death in the general population. By 1990, this cause had moved into second place, where it remains. In 1991, 10.2% of all deaths were due to malignant neoplasm of the trachea, bronchus, and lung; stomach; and uterine cervix. Malignant neoplasms are the second leading cause of death among females aged 5–24 and 65 and over, and the leading cause in the group aged 25–64. Among men, cancer of the trachea, bronchus, and lung and prostate cancer are the most frequently diagnosed forms.

Accidents and Violence

In 1991, almost 1 out of every 10 deaths was caused by an accident, 36% of which were motor vehicle accidents. The same year, this cause ranked third as an overall cause of death, whereas in 1980 it had ranked first. The rate decreased 36% between those 2 years. In 1990, the average age of persons killed in accidents was 29.3, and the years of potential life lost from this cause were estimated to total 1.4 million (see Table 2). About 87% of those who die from violent causes are males, and that figure has remained stable since the early 1980s.

Homicide ranked 10th as a cause of death in 1990 and 1991. It is estimated that more than half a million years of potential life were lost due to this cause. The average age of homicide victims was 32.4 (Table 2, p. 281), and more than half were between 15 and 34 years of age. Homicide mortality ranged from 3.2 per 100,000 in Oaxaca, which has a high degree of impoverishment, to 2.4 in Nuevo León, which has a low degree.

Suicides are relatively infrequent—about 2,000 annually. In 1990, this cause was responsible for 32,419 years of potential life lost; 56.4% of suicides occurred in urban areas, and 30.0% involved persons aged 15–24. The number of deaths from this cause is under-registered.

Behavioral Disorders

In 1990, of people between the ages of 12 and 65, 25.8% indicated that they currently smoked, and more than 25% said they had smoked at some time. Among men, the prevalence of smoking is twofold that found among women. Smokers are most numerous in the 18–29 age group. Of the interviewed persons aged 12–65, 45.4% said they had never smoked.

Alcoholic beverages are consumed by 27.6% of the urban population aged 12–17 and 33.5% of those aged 18–65; 12.5% of urban males and 0.6% of urban females between the ages of 18 and 65 are alcohol-dependent. The problem is most prevalent among those aged 18–29. In 1991, the rate of alcohol addiction was 2.94 per 100,000. Of those interviewed, 54.3% indicated that they did not drink alcoholic beverages. Cirrhosis and chronic liver disease constitute the ninth leading cause of death.

In 1990, males were the most frequent users of psychotropic drugs, while females were the greatest consumers of medicinal drugs. The young population

showed the highest proportion of drug use. The most common drugs used, in descending order, were marijuana, tranquilizers, stimulants, and inhalants; no active users of heroin were found. Of the persons aged 12–65 who were surveyed, 95.2% said they had never used any type of drug. In 1988, juvenile therapy facilities treated 7,390 cases of drug dependency; 91.6% of the patients were males. The problem was most frequent among those aged 15–19, followed by those aged 20–24 and 25–29.

The highest prevalence of smoking (33.3%) is found in Mexico City, while the highest levels of alcoholism (12.3%) and drug addiction (3.6%) are in the northwestern region (Table 3).

It is believed that 1% of the population suffers from some serious mental disorder and that 10% will suffer from such a condition at some time in their lives. The prevalence of psychosis is estimated at between 10 and 14 per 1,000 population. About 12.6 per 1,000 people have some degree of mental retardation. A high percentage of mental disorders are major functional psychoses, such as schizophrenia and affective psychosis, followed by disorders resulting from organic brain damage. The prevalence of epilepsy ranges from 0.9% to 2.1%, although there are indications that it may be higher. In 1991, epilepsy was the fourth leading reason for outpatient visits among the population under 18 (the first three reasons were behavioral disorders, learning disorders, and language disorders, which accounted for 48.1% of total visits). The prevalence of neurosis has increased, and the rates of schizophrenia, chronic and transitory organic psychosis, and mental retardation remain high.

Oral Health

The only information available pertains to schoolchildren, among whom the decayed, missing, and filled teeth (DMF) index is estimated to be above 5.0. The foremost problem is dental caries.

Risk Factors

Risks in the Physical Environment

The ongoing contamination of virtually all the soil and the surface and underground water sources by biological and industrial wastes, fertilizers, and pesticides is a major problem in the valley of Mexico, in the basin of the Lerma and Santiago Rivers and Chapala

TABLE 3
Prevalence of smoking, alcoholism, and drug addiction among the urban population aged 12–65, by region of residence, Mexico, 1988.

| Region | Smoking ^a | Alcoholism ^b | Drug addiction ^c |
|---------------|----------------------|-------------------------|-----------------------------|
| Northwest | 28.4 | 12.3 | 3.6 |
| Northeast | 26.0 | 7.0 | 1.4 |
| North-central | 26.2 | 5.6 | 2.2 |
| México City | 31.3 | 5.6 | 2.1 |
| Central | 25.1 | 2.9 | 2.1 |
| South-central | 22.0 | 5.5 | 1.7 |
| South | 22.8 | 4.8 | 2.7 |

^aPercentage of population that smokes.

^bPercentage of population that drinks alcohol regularly.

^cPercentage of population that used drugs in the last year.

Source: Secretariat of Health, Division of Statistics, Information Processing and Evaluation. National Survey of Addictions. Mexico, 1990.

Lake, and in areas where wastes are discharged from large urban and industrial centers. In 1992 and 1993, air pollution in the Mexico City metropolitan area reached alarmingly high levels. The concentrations of ozone in the atmosphere during rush hours were sometimes as high as 900 µg/m³, four times the maximum level recommended by WHO. Levels of sulphur dioxide, particulate matter, and carbon monoxide are more than double WHO's suggested standards. Lead levels in the air have been reduced since 1988 through the introduction of measures aimed at improving the quality of fuels. Increases in industrial activity, motor vehicle traffic, and sources of ionizing radiation and the use of petroleum gases, coupled with timber-cutting and forest fires, are leading to further environmental deterioration. Pollution is particularly severe in large urban areas, owing to toxic, hazardous, and industrial wastes. Hydrocarbons, cadmium, methyl mercury, and polyhalogenated compounds are the environmental pollutants that pose the greatest risk and are most harmful to health.

Risks in the Work Environment

In 1991, there were 1,618 reported cases of poisoning by pesticides, most of them among males aged 15–24.

Natural Disasters and Industrial Accidents

In 1991, an explosion in a fertilizer and pesticide manufacturing plant poisoned 96 people. In 1992, an explosion caused by the presence of hydrocarbons in

Guadalajara's sewer system caused extensive damage and killed more than 200 people. The country also has experienced emergency situations as a result of floods.

Housing and Urbanization

Nationwide, one of every five dwellings has a dirt floor; in the most impoverished states, the proportion is as high as 50%. The housing shortage in 1990 was estimated at 6.1 million. In 1990, the average number of occupants per dwelling was 5.0, with the number ranging from 5.7 in states with high degrees of impoverishment to 4.4 in less impoverished states.

Food Contamination

Foodborne diseases rank second among notifiable communicable diseases and in 1990 represented 27.6% of all such diseases. In terms of etiology, of all laboratory-diagnosed cases during the 1988–1989 period, diseases of bacterial origin were most frequent (56.5%), followed by parasitic diseases (43.0%) and viral diseases (0.3%). Mortality from foodborne diseases decreased 35.6% between 1961 and 1989. During the 1986–1990 period, 393 outbreaks and 15,561 cases of foodborne disease were recorded. Bacterial diseases accounted for 42% of all the outbreaks, which involved practically all types of prepared foods.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

The 1989–1994 National Development Plan establishes the country's policies on health, social security, and social welfare. The general objective of these policies is to ensure protection for and improve the social welfare of all Mexicans through the provision of services and benefits in a timely, efficient, equitable, and humanitarian manner. The policies advocate joint action on the part of communities and the three levels of government as an effective means of securing the necessary resources.

The main general health policies call for efforts to encourage a culture of health, universal access to health services, prevention and control of diseases and

accidents, environmental protection and basic sanitation, attention to family health and population growth, and the promotion of health care.

Population Policies

The country's population policies are oriented toward regulating population growth. They view the family as society's basic core, and advocate the strengthening of family planning programs for the benefit of parents, children, and the community.

Health Policies and Strategies

The institutions of the sector are organized and administered according to policies that envision the functional coordination of the National Health System by adapting the legal framework and by establishing mechanisms for planning the most effective use of resources, strengthening local health systems, and decentralizing services. These policies are complemented by efforts to simplify and streamline administrative processes, improve intersectoral coordination, and encourage community participation.

The sector's policies on human resources aim primarily at establishing the needs in each federative entity with regard to training, decentralization, formulation and updating of standards, and human resource development within local health systems. The main financing and spending strategies are to at least maintain the sector's current share of the GDP, increase the participation of state and municipal governments in terms of revenues and fiscal policy, and seek external funding sources. The policies regarding physical resources in the health sector aim at developing infrastructure while making the best possible use of existing resources, and creating new infrastructure in areas that are underserved or lack services.

In regard to food and nutrition, the policies call for direct food aid, public education, food and nutrition surveillance, and food safety and preservation. The two main strategic means for implementing these policies are the National Food Safety System and the Food and Nutrition Surveillance System. The policies on drinking water and sanitation emphasize housing and living conditions, environmental protection and basic sanitation, and preservation and restoration of ecological balance. As for drugs and immunobiologicals, the policies are oriented toward improving procurement, distribution, and storage systems; updating essential

drug lists; and encouraging research on drugs and biologicals in order to boost production.

The policies on research and development of health technology are intended to facilitate the technological modernization of the productive apparatus through the acquisition, assimilation, adaptation, and dissemination of technology. These policies call for action aimed at increasing public funding and expanding scientific infrastructure, with emphasis on the development, integration, and repatriation of qualified human resources.

In regard to priority programs and population groups, the policies provide for equitable and universal access to high-quality health services; priority is given to poor groups and to mothers and children. The policy on AIDS prevention prohibits payment for donated blood and advocates the use of the mass media to educate specific groups. Nongovernmental organizations are promoted as a means to foster community participation. Regarding mental health, rehabilitation of patients, and social services for those with mental health problems, the policies seek to promote care at the primary level, modernization of psychiatric hospitals, and research and teaching.

In the area of health promotion, the policies encourage citizen education and responsibility for individual, family, and community health and environmental protection. Finally, the policies on health legislation are geared toward periodic review and updating of health-related laws, in particular the general law on health and the law on social security.

Organization of Services

Personal Health Care Services

The National Health System is composed of public and private sector institutions. The public sector includes social security institutions and institutions that provide health care and social services to population groups not covered by any health care scheme. The Secretariat of Health is the sector's lead agency, and it operates institutions at all levels of complexity, including 10 national health institutes. Among the public sector social service institutions are the National System for Comprehensive Family Development, the National Institute on Aging, and several juvenile therapy facilities.

The social security system institutions in the public sector serve both government and private sector work-

ers and their family members. The system comprises the Mexican Social Security Institute (IMSS), the Social Security and Services Institute for Government Employees (ISSSTE), the Social Security Institute for the Armed Forces, the Health Services of the National Naval Forces, and the Health Services of *Petróleos Mexicanos* (PEMEX), the State-run oil company.

The private sector includes professionals and institutions that provide outpatient and hospital care, health insurance companies, and practitioners of traditional and alternative medicine.

In 1991, the social security system covered 54.7% of the population; the remaining 45.3%, the population without coverage, came under the nominal responsibility of the other services. Accurate figures on the number of people receiving care in the private sector are not available. The population that lacks care because of geographic, economic, or cultural accessibility problems is estimated at 6.0% of the total. Coverage by some institutions overlaps somewhat. In 1991, 75.5% of the social security system's user population was being served by the IMSS, 18.5% by the ISSSTE, 2.5% by the PEMEX health services, and the rest by two other institutions. Of the population without coverage that used public services (64%), 32.7% sought care at institutions of the Secretariat of Health, 26.1% used IMSS services (under the Institute's "Solidarity" program), and 5.8% received care at establishments of the Federal District.

At the local level, public health services are coordinated by health districts (of which there were 218 in the country as of August 1993), which administer health units and services at the primary care level and, in some cases, at the secondary level. At the intermediate level, state health authorities coordinate the health jurisdictions and tertiary care institutions. The political-administrative regime varies according to whether the states are decentralized (i.e., they have signed a formal agreement for the transfer of health services) or deconcentrated. The Secretariat of Health exercises general political and regulatory leadership and oversight in the health sector. The programmatic and operational links that exist between institutions in- and outside the sector have been fostered by the Strategic Project for Development of the Health Districts, which is promoting the strengthening of local health systems.

In some mixed health care systems, modern and traditional medicine coexist. In 1982, a survey was conducted and joint activities were undertaken with 887 traditional healers. In 1991, working ties were established with 35 organizations of indigenous practition-

ers, and that same year 1,030 meetings were held between health teams and traditional healers. At present, the establishment of mixed rural hospitals, traditional clinics, and community pharmacies is being promoted.

Coverage

Hospital Discharges. In 1991, a total of 3.5 million hospital discharges were recorded in the public sector, 33.6% of which were from institutions that serve the population without coverage; the rest were from social security institutions. Broken down by medical specialty, the greatest proportion of these discharges came under the category of obstetrics and gynecology (39.7%), followed by surgery (21.0%), internal medicine (16.7%), and pediatrics (14.9%). In 1991, there were 90,124 hospital deaths, with the same proportional distribution between institutions serving the population without coverage and social security institutions as was seen in hospital discharges.

Outpatient Services. In 1991, the number of visits to public health care institutions totaled 147.7 million, 56.5% of which were first-time visits; 65% were general visits, 15.2% were specialty visits, 10.5% were emergency visits, and 5.8% were dental visits. Pediatrics accounted for the greatest proportion of specialty visits. One-fourth of the patients seen had no coverage.

Diagnostic, Treatment, and Laboratory Services. A total of 115.8 million laboratory tests were performed for 27.4 million people, as were 12.7 million radiology studies for 10.5 million patients, and 2.0 million tests of other types for 1.7 million persons; respectively, only 18%, 20%, and 8% of these tests involved members of the population without coverage. Physical therapy sessions totaled 10.1 million for 2.2 million people.

Care during Pregnancy, Childbirth, and the Puerperium. During 1991, 6.3 million prenatal examinations were carried out. Social security institutions accounted for 62.5% of that total and the institutions serving the population without coverage accounted for the rest. That year, prenatal care was provided to 1.9 million pregnant women, with an average of three prenatal visits per woman; 92.7% of these women were cared for by a physician. Institutional deliveries totaled 1.5 million, 62.1% for the IMSS and 25.2% for the Secretariat of Health. The proportion of births attended by physicians was 79.0%. Abortions accounted for 9% of hospital discharges from all obstetrical

causes; the average stay in abortion cases was 1.9 days, compared to 1.03 for normal deliveries. The percentage of institutional deliveries is lower in rural areas than in urban areas.

The country has two national programs aimed at extending health service coverage. One provides care to 13,021 communities through health auxiliaries and the other serves 12,294 communities through rural health assistants supported by a health team from the closest rural medical unit. Trained traditional birth attendants constitute an extremely valuable resource for the extension of coverage. As of early 1992 almost 23,000 of the 100,000 existing traditional birth attendants had been registered. These women receive ongoing training, material, and basic equipment to enable them to perform their duties under more suitable conditions. Since 1991, efforts have been directed at strengthening the mechanism of reporting by traditional birth attendants, as part of the Simplified Epidemiologic Surveillance System.

In 1991 a practice of "rooming-in" was instituted in 158 hospitals, 86% of which serve the population without coverage, and the "mother- and baby-friendly hospital" program was launched in 22 hospitals. In the same year, committees were established to study maternal and perinatal mortality in 534 hospitals throughout the 32 federative entities.

Since 1989, a program has been under way to promote self-care, including nutritional surveillance. As of 1992, more than 12,000 health workers and 180,000 "health promoters" had been trained to teach primary health care practices in households and communities.

Growth and Development. The Food and Nutrition Surveillance System targeted children under 5. Arm circumference is the measurement initially used to detect children at risk, who are then referred to care facilities for nutritional rehabilitation and other measurements; children are measured twice yearly. During the first half of 1991, 1.3 million children were measured and 13.5% were classified as malnourished; 7.4% recovered.

Immunization. In 1990, vaccination coverage among children under 5 was estimated at 73.1% for three doses of OPV, 60.1% for three doses of DPT, 73.6% for BCG, and 85.4% for measles vaccine. The figures for 1992 were 96.0%, 96.0%, 95.7%, and 97.0%, respectively. During National Vaccination Week in 1993 coverage levels of 94.4% for OPV, 93.7% for DPT, 96.7% for BCG, and 94.8% for measles were achieved.

Family Planning. The National Interinstitutional Program for Family Planning offers family planning services, as well as education and guidance, through institutions of the National Health System and non-governmental organizations. In 1991 there were an estimated 13.2 million women of childbearing age living with a male partner, 46.3% of whom were using some modern contraceptive method. The states with low degrees of impoverishment showed the highest levels of contraceptive usage, while most of those with medium-to-high degrees of impoverishment were below the national average. Social security institutions provided 35.5% of the coverage and institutions serving the population without coverage provided 10.7%.

In 1991, 258,273 voluntary surgical sterilizations were performed, 94% of them on women. Social security institutions performed 78% of these surgeries, and institutions serving the population without coverage accounted for the rest. A total of 626,942 women participated in the Postpartum Contraception Program, with 52% requesting IUDs, 27% choosing hormonal contraceptives, and 21% opting for sterilization. In 1987, 18.2% of the participants had IUDs, 36.2% were sterilized, 18.2% used hormonal contraceptives, and 14.7% relied on traditional methods.

Food Aid Programs. In 1990, these direct subsidy programs aided more than 2 million families. The Community Social Supply Program markets staple commodities through special stores, benefiting a target population of 44 million, 67.5% of which is rural.

Dental Services. The Oral Health Program primarily targets the school-age population. The strategy of salt fluoridation benefits 70 million of the country's inhabitants. A program for topical fluoride application carried out in the schools covers 80% of schoolchildren. This program includes a strong health education component.

Services for the Disabled. In 1992, the National System for Comprehensive Family Development provided outpatient care for 597,410 disabled persons (1.1 million rehabilitation therapy sessions, 18,228 functional assistance sessions, and 1,017 guidance sessions for patients and family members) and inpatient care for 32,470. In 1992, the IMSS awarded 259,000 disability subsidies and 140,000 permanent disability pensions, an increase of 60% over 1986.

Other Services. In 1989, the Undersecretariat of Animal Husbandry and the Division of Animal Health

were created within the Secretariat of Agriculture, in order to strengthen the country's animal health programs. The modernization process under way in this area calls for updating the pertinent legislation, including revision and adaptation of commercial and health regulations to bring them into line with the North American Free Trade Agreement, and developing negotiation, participation, and support systems and institutions. State-level committees, established for the promotion and protection of livestock-breeding, include representatives of the federal and state governments, producers, trade unions, and other related sectors and deal with issues of livestock transport and health regulation. Livestock producers operate 126 animal health diagnostic laboratories. Campaigns are conducted to eradicate bovine tuberculosis, classical swine fever, Aujeszky's disease, fowl salmonellosis, Newcastle disease, paralytic rabies, and *Boophilus* ticks, and a national animal health emergency system has been established. In 1990, a Subdivision for Zoonosis Control was created within the Division of Preventive Medicine. The Intersectoral Rabies Control Committee includes representatives from National Health System institutions, the education sector, the mass media, nongovernmental organizations concerned with animal welfare, and the overall community. Canine rabies vaccination is available free of charge throughout the country.

The food safety control and inspection system is a responsibility of the Secretariat of Health. The Secretariats of Agriculture, Fishing, and Commerce regulate and control the breeding, capture, transport, and marketing of species intended for human consumption. In 1991, sanitary control procedures were simplified.

Salt iodization has been mandatory since 1963. This regulation is generally complied with, except for some lapses in the production of coarse salt, which represents about 30% of total salt production.

The Government carries out intersectoral activities linking the areas of health and tourism, in order to improve the health infrastructure and services in touristic areas.

Environmental Services

Infrastructure. The National Ecology Institute sets environmental standards and regulations, and the Office of the Attorney for Environmental Protection enforces them and penalizes violators. Within the Secretariat of Health, the Division of Environmental Health, Occupational Health, and Basic Sanitation executes en-

environmental recommendations. When the first cases of cholera were detected, actions to combat diarrheal diseases were stepped up, especially the supply of chlorinated drinking water, treatment of wastewater, execution of large-scale latrine-building projects, and improvement of hygiene in housing and food handling. Priority programs are under way for the construction of highways, sanitary disposal of solid waste, protection of the health of groups of workers considered to be at highest risk, basic sanitation in indigenous communities, and environmental impact studies. At the local health system level, environmental activities are being carried out with the active participation of local authorities.

The National Water Commission and the Mexican Institute of Water Technology have been strengthened, and the agencies that operate drinking water, sewerage, and wastewater treatment services at the local level have been consolidated. Programs exist for institutional development, human resource training, and improvement of the operation and maintenance of systems. Projects also are under way for certification of materials, equipment, and equipment operators, as well as for efficient water use. The explosion in the Guadalajara sewer system led to risk studies and the formulation of plans of operation for natural or technological disasters.

Services. In 1992, coverage with drinking water services in urban areas was estimated at 90.4% and was over 95% in areas with more than 80,000 inhabitants. Coverage in rural areas is 66.0%. Seven states supply drinking water services to more than 90% of dwellings, but in five states only 56%–60% of the dwellings have service. Sewer system coverage in urban areas is 81.4%, and rural sanitation coverage is 28.7%. The Federal District has the highest proportion of dwellings connected to wastewater disposal systems (93.8%), and the state of Oaxaca, which has a high degree of impoverishment, has the lowest (29.9%).

The Clean Water Program, launched in 1990, is intended to ensure compliance with standards for safe drinking water and disposal of wastewater. Under the national strategy for controlling water pollution, which went into effect in 1991, treatment of wastewater has been increased and local water companies have been created in 90% of communities with more than 80,000 inhabitants. Although drinking water supply problems persist in remote rural areas, wastewater treatment has been implemented in some places and work has begun on the construction of 1 million latrines.

The Metropolitan Commission for the Prevention and Control of Environmental Pollution in the Valley of Mexico coordinates a comprehensive program that includes activities to regulate the oil industry, transportation, private industry, and thermoelectric power plants and service establishments, as well as activities to promote reforestation and ecological restoration, research, ecological education, and public information. Between 1990 and 1992, the rural reforestation program planted 8.6 million trees. The External Radiological Emergency Program was created to prevent accidents and coordinate activities to prevent harm to health from the Laguna Verde nuclear power plant.

With a view to identifying, minimizing, and controlling environmental health hazards, the Division of Animal Health conducts epidemiologic studies, formulates standards and regulations, monitors high-risk companies, issues health licenses, and provides guidance and training for those responsible for environmental health regulation at the state level. The Division also oversees an interinstitutional group on environmental and occupational health.

The intersectoral commission of the Secretariats of Commerce, Agriculture, Social Development, and Health regulates and controls the processing and use of pesticides, fertilizers, and toxic substances. There are state-level programs on workers' health. Special attention is given to the highest-risk groups, including workers in the border assembly plants, indigenous peoples, refugees, workers in the informal sector, and women and children who work as street vendors.

Tremendous efforts are being made to reduce the contamination of water resources in the main river basins and in the country's major tourist areas.

Health Promotion

Health Education. An integrated health promotion and education plan has been formulated with a view to instilling a culture of health in the population. Among the most noteworthy joint endeavors between the health and education sectors are an agreement between the Secretariats of Health and of Education for health promotion and health care in the public schools, the Program for Psychosocial Health, and the Municipal Health Program.

Mass Communication. The Division of Health Promotion and Mass Communication distributes a wide range of health education materials at the national, state, and local levels. Health messages previ-

ously approved by the Interinstitutional Committee on Educational Communication are broadcast on radio and television.

Health Research and Technology

The Secretariat of Public Education, in coordination with the Secretariat of Health and the National Science and Technology Council, directs the development of health research and technology. The National Health Research Registry System tracks the progress of research conducted by health and educational institutions. In 1992, the registry listed 6,871 studies in progress or concluded. Since 1976, the National Health Information and Documentation Center has been providing access to various national and international technical and scientific information systems.

The number of scientific journals published in the country increased from 67 in 1980 to 91 in 1989. Of the articles published in these journals, 75% concern clinical research, 17% biomedical research, and 8% public health; 42% of the articles published are reports on the progress or findings of original studies.

Geographically, the Federal District accounts for 67.5% of the research conducted in the country, followed by the states of México, Jalisco, Nuevo León, and Morelos, where the National Public Health Institute is located. The Center for Development and Technology Applications of the Secretariat of Public Health is responsible for maintenance, production, and training in the area of biomedical equipment.

Available Resources

Human Resources

Availability by Type. It is estimated that in 1991 the National Health System had 502,000 active workers, 85% of whom were employed in the public sector and 15% in the private sector, including private hospitals. In the public sector, the work force was distributed among institutions providing care for the population without coverage, which accounted for 33.8% of the human resources; social security institutions, which accounted for 60.8%; and social welfare institutions, which employed 5.3%. In 1991, medical personnel, including physicians, dentists, specialists, and fellowship recipients, made up 25% of the health work force, while nursing and other paramedical personnel constituted 42%, technical diagnostic and therapy per-

sonnel represented 5%, and administrative and maintenance personnel comprised 28%. There are no major differences between social security institutions and institutions serving the population without coverage in terms of the proportions of the various types of personnel. The total number of physicians in the country is estimated at 97,971. Nursing personnel are estimated to number 141,404, and paramedical personnel, 29,310.

Training of Health Personnel. In 1993, there were 58 schools of medicine (14 private), 53 dental schools (16 private), 37 professional nursing schools (4 private), and more than 180 technical nursing schools, as well as 205 post-secondary schools (90 private) offering training in nine health professions. In the field of public health, four institutions are devoted exclusively to graduate training, one school offers an undergraduate degree, and there are 27 other training programs.

Training of technical personnel has been a priority since 1989. Under a project for the development of prototype health districts, staffing needs have been reevaluated and personnel have been trained, hired, and redistributed.

Financial Resources

Funding. Most funding for the institutions that serve the population without coverage comes from the public treasury or the national budget; this is complemented by state and municipal contributions and user fees. The institutions of the social security system receive funding from three sources: employers (businesses, entities, or individuals), employees, and the government. The relative share of each source varies depending on whether coverage is provided mainly by public or private sector workers. In the case of the IMSS, 90.3% of the funding comes from employer and employee contributions, 5.0% from government contributions, and 4.7% from other sources, while for the ISSSTE, 28.5% comes from worker contributions, 60% from government entities and agencies, and 11.6% from other sources.

Spending. Social security institutions devote only 63% of their resources to health, with the rest going to provide disability, old-age, unemployment, and death benefits, and other services, such as child care. The institutions that serve the population without coverage, however, spend close to 90% of their resources on health.

In 1991, 59.9% of the total budget allocated for health was devoted to curative care, while only 4.7% was used for preventive care; 4.0% was devoted to social welfare benefits, 11.0% to administration, and 20.5% to activities connected with other programs. The social security institutions spent a larger proportion on curative care than did the institutions serving the population without coverage—62.9% versus 47.2%. The latter institutions devoted more to preventive care—10.8%, as compared to 3.2% for the social security institutions. The institutions serving the population without coverage also spent more on administrative costs (20.6%) than did the social security institutions (8.3%).

The health budget for the 5-year period 1987–1991 increased considerably in absolute terms; however, as a proportion of the GDP the increase was quite small—from 2.3% to 2.7%. The health sector's share of the total public sector budget decreased from 18.4% in 1990 to 15.6% in 1991.

Physical Resources, Equipment, and Supplies

Health Care Facilities. In 1991, the National Health System (public health and social security) comprised 13,812 medical care facilities, 94.4% of which were outpatient facilities and the rest were hospitals (636 general and 136 specialized); 67,703 beds; 36,310 physician's offices; 2,805 operating rooms; and 4,235 delivery rooms. As compared to 1990, the number of medical facilities increased 4.8% and the number of beds rose 7.0%. Institutions serving the population without coverage accounted for 77.1% of the outpatient facilities and 45.2% of the hospitals, 43.6% of the beds, 51.5% of the clinics, 40.4% of the operating rooms, and 84.7% of the delivery rooms.

The total number of medical facilities serving the population without coverage more than triples the number of social security facilities, although the social security system covers a much larger proportion of the population. This is due to the fact that the population without coverage is scattered through a wider geo-

graphic area than the population covered by social security, which tends to be concentrated in large cities where the major employers are located. However, social security hospitals outnumber the hospitals serving the population without coverage—which accounts in part for the greater proportion of curative care provided by social security institutions. Preventive care is more the province of the institutions that serve the population without coverage.

Of the 1,790 registered private medical facilities, 81.0% have fewer than 15 beds, 9.7% have between 15 and 24, 5.8% have between 25 and 49, and 3.5% have more than 50.

The National Health System produced 1,185.5 doctor visits, 40.8 hospital discharges, 2.4 surgical interventions, and 148.7 X-rays per 1,000 population in 1991.

It is recognized that both the coverage and the quality of health care among indigenous groups is deficient. The Secretariat of Health reported the existence of 79.3 beds and 96.4 physicians per 100,000 indigenous population, which is the equivalent of 1 bed for every 12,000 people and 1 physician for every 7,265 people in this population group.

Laboratories, Blood Banks, and Other Diagnostic and Treatment Services. In 1991, the National Health System had 1,134 clinical and 338 pathology laboratories, 1,961 radiology facilities, and 211 blood banks. The institutions that serve the population without coverage accounted for 48.1%, 31.9%, 40.2%, and 47.4% of these resources, respectively. A network of public health laboratories covers the entire country and supports the National Epidemiologic Surveillance System.

Drugs and Biologicals. Between 1988 and 1992, the Division of Biologicals and Reagents, which imports and produces biologicals for national use, improved the vaccine manufacturing process and enhanced quality control techniques for biologicals, thereby ensuring that products made in the country will comply with quality standards.

MONTSERRAT

GENERAL HEALTH SITUATION AND TRENDS

Montserrat, a relatively mountainous island that extends for 102 km², is part of the Leeward Islands. The island is a British dependency with its own system of government. The executive branch comprises a Chief Minister, four cabinet ministers, and a Governor who represents the British Government; the legislative branch includes cabinet ministers and other elected representatives.

Health and Living Conditions

Construction accounted for 24% of the GDP and was the largest sector in the economy, even before Hurricane Hugo's damage to many of the island's buildings; tourism and financial services also contribute significantly. The GDP increased from US\$ 2,738 per capita in 1983 to US\$ 3,550 in 1986 and US\$ 6,133 in 1990. The agricultural sector has rebounded, remaining strong in 1991.

The rehabilitation effort following Hurricane Hugo led many workers from other Caribbean countries to seek employment in Montserrat, particularly in construction and tourism. Until 1991, the Government continued to maintain a fairly liberal work permit policy to meet the construction demands in the public and private sectors. However, the Government is concerned with the apparent increase in the overall shortage of employment for Montserratians and has now given priority to rationalizing the work permit policy.

Adult literacy is 96% and nearly all children 5–15 years old are enrolled in school.

Population

A population census conducted in May 1991 showed a total population of 10,444 (5,219 males and 5,225 females), which was less than the 1989 estimated mid-year population of 11,924. Table 1 shows population structure by age group and sex.

In 1989 there were 154 live births (compared to 186 in 1988 and 175 in 1990), for a birth rate of 13 per 1,000 population and a fertility rate of 52 per 1,000 females 15–44 years old, the lowest values recorded for these rates. The trend in the 1980s has been toward decreasing birth and fertility rates. Total fertility in the period 1985–1990 was estimated at 2.3 children per woman.

Mortality

The crude death rate in 1990 was 13.5 per 1,000 population, a high figure compared to previous years. There were 161 deaths that year, an increase of 36 over the average 125 in previous years.

In the 3-year period 1988–1990, there were 15 stillbirths out of a total of 530 deliveries, for a stillbirth rate of 28.3 per 1,000 total births. There were 10 infant deaths in the period, representing an infant mortality rate of 19.4 per 1,000 live births; of these 10 deaths, 8 occurred during the first week of life and 1 in the third week. Main causes were prematurity and respiratory distress syndrome. There were no deaths in children 1–4 years old.

In 1988–1990, the principal causes of death in all age groups combined were heart disease, including hypertension (ICD-9, 390–429), 90 deaths; pneumonia and other respiratory diseases (480–519), 51 deaths; malignant neoplasms (140–208), 46 deaths; cerebrovascular accidents (430–438), 34 deaths; and atherosclerosis (440), 22 deaths.

Diabetes mellitus (250) was reported as the cause in 17 deaths in 1988–1990, and was named as a contributing factor in 16% of all deaths in 1990. Cerebrovascular accidents were a contributory factor in 15% of deaths in 1990. Hypertension was found to play a contributory role in 22% of all deaths in 1990.

There was one maternal death in 1989, two in 1991, and one in 1992. There was one death from AIDS in 1990.

Morbidity

In 1990, there were 1,661 admissions to Glendon Hospital, 240 (14.4%) of them for obstetric reasons

TABLE 1
Population by age group and sex, Montserrat,
1991 census results.

| Age group | Total | | Male | | Female | |
|-------------|--------|-------|-------|------|--------|------|
| | No. | % | No. | % | No. | % |
| Total | 10,444 | 100.0 | 5,219 | 50.0 | 5,225 | 50.0 |
| 0-4 | 880 | 8.4 | 459 | 4.4 | 421 | 4.0 |
| 5-14 | 1,841 | 17.7 | 948 | 9.1 | 893 | 8.6 |
| 15-24 | 1,766 | 16.9 | 887 | 8.5 | 879 | 8.4 |
| 25-34 | 1,764 | 16.9 | 899 | 8.6 | 865 | 8.3 |
| 35-44 | 1,278 | 12.3 | 687 | 6.6 | 591 | 5.7 |
| 45-54 | 815 | 7.8 | 431 | 4.1 | 384 | 3.7 |
| 55-64 | 683 | 6.5 | 306 | 2.9 | 377 | 3.6 |
| 65 and over | 1,417 | 13.6 | 602 | 5.8 | 815 | 7.8 |

Source: Government of Montserrat, Statistical Unit, 1993.

(640-676). The principal nonobstetric group of causes of inpatient morbidity was mental disorders (290-319), which ranked first, accounting for 154 admissions (9.3%); 70% of these patients were in the age group 20-44 years old, most with recurring psychosis. Hospital records show that 76% of those patients admitted suffered from schizophrenia, 8% from substance abuse psychosis, 4.5% from manic depressive psychosis, 7% from other psychoses, and 4% from depression.

Diseases of the respiratory system (460-466) were the second most common cause of admission, with 136 (8.2%) in 1990, followed by diseases of the gastrointestinal tract (530-579) with 131 admissions (7.9%), heart and vascular diseases (410-459) with 115 (6.9%), and "injuries" (800-939) with 107 (6.4%).

Cerebrovascular disease is the most common reason for admission in the age group 60 years old and older; hypertensive disease and diabetes mellitus are common in the 45 and over age group.

A review of diagnosis by age of those admitted to the surgical unit shows that eye problems, gastrointestinal disease, and prostatic disease were most common in the group 60 years old and older, while fractures resulting from injury were most common in the age group 15-44 years old.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Child Health

In children 1-4 years old, malnutrition prevalence was under 1% in 1992; 3.6% of children under 5 years

old were below 80% weight for age. There is a decreasing trend in the proportion of low birthweight infants, from 9.6% in 1988 to 5.2% in 1992.

Gastroenteritis in children under 5 years old accounted for 22% of total pediatric admissions to Glendon Hospital in 1990; respiratory tract infections accounted for 8% and pneumonia for 6% of admissions to the hospital's pediatric unit. This morbidity pattern also is reflected in district clinic attendances (other than well-child clinics) for children under 5 years old. The main reasons for attendance in 1990 were respiratory tract infections, gastroenteritis, diarrhea and vomiting, skin infections, and asthmatic attacks.

In 1990, 46% of schoolchildren screened had dental caries. Other problems included skin infections 13.3%, visual impairment 7%, anemia 5.7%, and asthma 5%.

A nutritional survey of three age groups (preschoolers, primary-school students, and secondary-school students) was carried out between 1990-1992 by the nutrition officer to determine nutritional status and types of food consumed. The results showed a low prevalence of malnutrition but a fairly high prevalence of mild anemia in the younger age group. Of 188 preschoolers examined in 1992, 5.8% were classified as underweight and 7.4% as overweight. Of 193 primary-school children, 8.8% were underweight and 4.7% overweight. Of 119 secondary-school children, 1.6% were underweight and 5.0% overweight.

In 1991, 34.2% of 109 preschoolers examined had mild anemia (hemoglobin value 10-11 g/dl) and 3.8% had hemoglobin values below 10 g/dl. For 115 primary-school children the respective percentages were 23.0 and 2.6, and among 119 secondary-school children, 15.6 and 3.4, respectively.

Adolescent and Adult Health

Births to teenage mothers, which ranged between 25% and 33% of total births between 1981 and 1986, showed a downward trend between 1987 and 1991, with a high of 21.6% in 1990 and the lowest-ever recorded value of 15.4% (29 births) in 1988. Of 766 total births in the 3-year period 1981-1983, 242 (31.6%) came from teenage pregnancies. In the following 4-year period, 1984-1987, this percentage declined to 25.8 (224 births out of a total 868). In the next 4-year period the decline continued, to 19.0% (133 births out of a total 699).

In a survey carried out by the nutrition officer, 36% of pregnant women attending clinics had hemoglobin levels under 10 g/dl.

Diabetes and hypertension continue to be the main health problems affecting adults, particularly those 45 years old and older. Of all patients hospitalized for diabetes and hypertension, 89% and 93%, respectively, were over 45 years. Hypertension is a significant contributory factor for cerebrovascular disease, which was one of the leading causes of death. These two conditions were the main reasons for attendance by adults at district health clinics and at the hospital outpatient department. There are 219 persons on the diabetic register and 430 on the hypertensive register; 212 persons with cataracts are registered and are seen at clinics every 3 months.

Health of the Elderly

In 1990, 35% of all admissions to Glendon Hospital were of patients 65 years old and older, accounting for 80% of inpatient bed days. The main health problems in this group are cardiovascular and cerebrovascular diseases, neoplasms, eye problems, and osteoarthritis. This age group was most vulnerable to the effects of Hurricane Hugo, and the increase in the crude death rate in 1990 is attributed to a rise in deaths among older people.

Diseases and Health Impairments

Tuberculosis was reported in 13 persons in 1988, 5 in 1989, and 1 in 1990; there were 2 deaths from the disease in 1990. Other notifiable diseases reported between 1988 and 1990 were: *ciguatera poisoning*, 91 cases; *viral hepatitis*, 9 cases; *measles*, 2 cases; *gastroenteritis* in children under 5 years old, 214 cases; and *influenza*, 471 cases. No cases of *cholera* were reported.

Since the beginning of the epidemic through 1992, 1 person was reported as having *AIDS* and 6 as having tested positive for HIV out of a total of 3,355 tests performed in 1988–1992. HIV testing, which was introduced late in 1987, is performed on all blood donors and members of certain groups, including surgical patients and persons being tested for insurance purposes and work permits, as well as on request.

As part of the effort to combat the disease, an AIDS/STD council has been established, and the national program's coordinator, working with a small committee, monitors program implementation. Regional guidelines for the prevention and control of HIV and AIDS have been incorporated into the national program. One strategy for implementation is the

integration of AIDS and STD activities into the overall development of health care services, while strengthening epidemiologic surveillance and data management. Protocols for infection control also are being developed.

Of 10,872 VDRL tests conducted between January 1989 and November 1992, 961 (8.8%) were positive for *sypphilis*. In 1992 positive tests decreased to 4.5% compared with previous years (12.9% in 1989, 11.0% in 1990, and 8.2% in 1991); however, the number found positive is not an accurate assessment since some positives are repeat tests. Most persons who tested positive were between 16 and 44 years old. Ten persons tested positive for *gonococcal infection* between April 1991 and March 1992.

Mental disorders accounted for a significant proportion of hospital admissions. There were 218 registered mentally ill persons, 54% of whom were females; two were adolescent mental patients, but most were between 20 and 44 years old. The types of mental disorders, in order of importance, were chronic schizophrenia, substance abuse psychoses, manic depression and other psychoses, and depression. In 1990, there were 439 attendances at the community mental clinics, 142 home visits made, and 75 persons hospitalized.

In 1988–1989 steps were taken to identify and create a database of *handicapped children* in the community by having visiting specialists examine the children and identify their disabilities. There are 53 children between the ages of 0–16 years on the register. In 1990, these children were examined by two research pediatric registrars and recommendations were made for further management.

A program has been developed to ensure that all handicapped children receive the best possible education and medical and community care so that they can develop their physical, mental, and spiritual capabilities to the fullest. Program components include developmental screening; identification of the disability and resultant impairment; referral to the Pediatric Medical Clinic; therapeutic, educational, and social activities; collaboration with other agencies such as the Red Cross and the School, Education, and Social Welfare Departments; monitoring of each child's progress; and maintenance of a register of handicapped children.

Risk Factors

Montserrat lies within the hurricane zone and is at risk of eruptions from Soufrière Volcano. The island is still recovering from the devastation left by Hurricane

Hugo in September 1989. Hugo destroyed or severely damaged about 90% of the territory's buildings and wiped out almost all its agricultural production. The hospital was severely damaged, as were the district health clinics, which caused all health services to be disrupted and some documentation to be lost. However, health services continued to be provided from the damaged hospital and clinics through the efforts of health personnel, other public staff, and citizen groups assisted by teams of doctors, nurses, and environmental health workers from many other Caribbean countries.

A national emergency organization coordinates disaster prevention, mitigation, response, and recovery activities. Training activities for key personnel have increased, and community awareness programs are used to sensitize people to the need for preparedness. The Glendon Hospital Plan has been reviewed and revised since Hurricane Hugo.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Health Policies and Strategies

A draft public sector investment program, which includes the Ministry of Health's 5-year goals, aims, and objectives, was completed in 1991. A health personnel policy also was proposed as the key element in the reorganization and development of the health sector's strategic plans.

The following constitutes the Government's position on health care issues and its health care policy:

"Good health, although in itself a preferred state of being, also enables people to lead socially productive lives, thus contributing to the improvement of quality of life for the individual as well as society as a whole. Therefore, the Government of Montserrat is committed to the promotion of health, prevention of disease and where necessary to the treatment and rehabilitation of those who have fallen victim to disease or ill health within its financial capabilities."

It also is believed that a task of this scope can be achieved through the provision of a comprehensive health care delivery system that is accessible, available, and affordable to all the population. It acknowledges that some of this care must be provided overseas at tertiary level institutions and some by visiting specialists.

The national health policy is based on these two principles:

(1) That health is a fundamental right of every human being, that it is the duty of the Government to ensure that all citizens have access to proper health care whether they can pay for it or not, and that individuals and local communities are responsible for their own health within their own competencies.

(2) In assuming this responsibility, the Government also is guided by globally accepted goals and strategies, such as the principles of health for all and the strategy of primary health care. Special emphasis is placed on care of children from birth to school-leaving age; the elderly (60 years and over); those suffering from chronic diseases, such as diabetes, hypertension, and mental illness; and women of reproductive age.

Goals and objectives by program area were defined for the health sector. At the central level, the health team approach is used in decision-making and in planning and programming activities. An annual action plan outlines goals, objectives, activities, and a timetable for the implementation of each program. Priority has been given to cholera prevention programs; the prevention and control of AIDS and STDs; maternal and child health, including immunization coverage; and care of the mentally ill and handicapped children.

Organization of Services

Personal Health Care Services

In 1991, the Ministries of Health and of Community Services were combined under one Permanent Secretary. The Permanent Secretary is the Ministry's Chief Executive Officer and the Director of Health Services is the main advisor on professional and technical matters; there also is a health services manager. Technical responsibility for health services rests with the Director of Health Services.

Infrastructure. Functionally the health services are divided into district services and hospital services, and operate as a two-tier system at primary and secondary levels of care.

Primary level services are offered at the 12 health clinics: Plymouth and environs (1990 estimated target population, 2,981), Cork Hill (1,232), Kinsale (1,159), and Saint Patricks (468) in the Central District; Saint Johns (1,038), Cudjoe Head (582), Saint Peters (308), and Salem (1,156) in the Northern District; and Harris (664), Bethel (598), Long Ground (230), and Molyneaux

and environs (1,190) in the Eastern District. Each clinic is staffed by a nurse, and in each district there is a family nurse practitioner to whom clients may be referred for evaluation and management. Depending on the nature and complexity of the health problem, the client may be further referred to the medical officer, who visits the clinics weekly, or to a hospital. Private physicians also provide services at this level of care.

Secondary care is provided at Glendon Hospital (50 beds), which offers medical, surgical, pediatric, and obstetric inpatient services and outpatient services in treatment of casualties, surgery, medicine, prenatal and pediatric care, gynecology, ophthalmology, audiology, and dermatology. Technical support services include laboratory, X-ray, pharmacy, and physiotherapy.

Tertiary care is provided through referral of clients to regional and other health institutions, or by specialists visiting Montserrat to see referred clients. In 1989, 69 patients, and in 1990, 62 patients were referred to health institutions within the Caribbean (such as in Guadeloupe and Puerto Rico) and in the United States of America and the United Kingdom; most overseas referrals were to Antigua (28), mainly for the diagnostic services of gastroscopy and ultrasound examinations and for specialist consultations in orthopedics. Many persons seek medical care overseas as self-referrals.

Finally, Margetson Memorial Home is a 36-bed residential facility for the elderly that is staffed and supervised by personnel from Glendon Hospital. Many of the residents have no other place to live or any caregivers.

Coverage. Prenatal care is offered at the 12 district health clinics by a nurse midwife. Pregnant women are encouraged to attend clinics by the 12th week of pregnancy, or at least by the 16th. All pregnant women are evaluated at least once during pregnancy by the doctor in charge of obstetric services at Glendon Hospital. All pregnant women are referred to Glendon Hospital for delivery, and it is estimated that 60% of mothers who deliver at the hospital attend government prenatal clinics and 40% receive care from private physicians.

Delivery care is provided in Glendon Hospital's maternity unit, and most deliveries are attended by midwives. The annual average of cesarean sections is 9% of all births.

Regarding postnatal care, the mother is discharged on the third day, if there are no complications. Prior to discharge, her hemoglobin level is assessed, and a discharge summary is given for care by the district nurse who visits the home and follows up on mother and in-

fant for 10 days after delivery. Mothers return to the postnatal clinic at 6 weeks for an examination conducted by the family nurse practitioner; high-risk mothers are referred to the medical officer.

At the national level, maternal deaths are investigated by the Maternal and Child Health Committee.

Family planning services are offered by the family life services and by district clinics. The main components of this program are counseling and health education; physical examinations, including breast and pelvis; supply of contraceptive methods/devices; Pap smears; and pregnancy testing. In 1992, the total number of acceptors was 452, compared to 441 in 1991; there were 78 new acceptors in 1992, compared to 54 in 1991. Of females 15-19 years old, 9% use this service, and the majority of users are in the age group 20-35 years old.

A youth and family education project also is under way, and 72 youths have already been trained as peer counselors. One of the project's objectives is to reduce teenage pregnancies. There is also a weekly radio program, "Just for Teens," targeted to adolescents.

The goals for the child health services are to maintain full coverage, defined as a minimum of nine visits for all children under 1 year old, a minimum of four visits for all children 1-2 years old, and a minimum of two visits per year for all children 2-4 years old, as well as immunization against diseases included in the Expanded Program on Immunization for all children. These goals have been almost achieved—in 1992, coverage of children 1-2 years old was 99.9%, and coverage of children 2-5 years old was 95.0%; immunization coverage was 100% for BCG, DPT, OPV, and MMR. District nurses visit the two day-care centers and the 13 nursery schools each term. They are required to look for signs of conditions such as malnutrition, mental retardation, and infection or illness.

In terms of school health, preprimary-, primary-, and secondary-school children are given physical examinations by the family nurse practitioner upon admission to school and at scheduled intervals during their school careers. Approximately 475 school entrants and transfer students are given physical examinations each year. In addition, as a way to provide good nutrition, a school lunch program is in operation at 11 government schools. Approximately 82% of students participate in this program.

The dental health program aims at detecting and intercepting oral and dental health problems early, particularly among those younger than 15 years old. There are plans to reestablish the application of topical fluorides to schoolchildren.

The dental unit is located in the Glendon Hospital compound, and is staffed by one dental surgeon, two dental nurses, and two dental nursing assistants. It offers preventive, restorative, curative, epidemiologic, and surveillance services. An orthodontist visits monthly to see referred clients, and there also is a volunteer dentist program. From January to June 1992, a total of 460 amalgam restorations and 362 extractions were performed in a total of 1,428 client visits. Dental health care is available to all who qualify under the Government's health plan.

Throughout the island, the adult population is regularly screened for hypertension and diabetes, and each clinic keeps a register of diabetics and hypertensives in its respective district. Coverage of persons known to have hypertension or diabetes is 100% for regular follow-up care at diabetic and hypertensive clinics.

Care of the elderly is overseen by the Geriatric Services Committee chaired by a community development officer. Services include residential care at the Margetson Memorial Home and acute care services at Glendon Hospital. Community support is provided by the Social Welfare Department, public assistance programs, and nongovernmental organizations.

Regarding mental health, severely disturbed persons are sent to Antigua or Barbados for hospitalization, because there are no inpatient facilities to house them in Montserrat. The community psychiatric nurse, with the support of a district medical officer and a psychiatrist (who visits once a month), provides follow-up care in the community. Follow-up care also is provided to prison inmates with mental disorders. Community awareness programs in mental health and illness have been introduced, so that communities and families can support the mentally ill and accept them as members of society. The database of persons with mental disorders is being updated, and there are plans to review mental health acts and laws, particularly those dealing with the detainment of unconvicted mental patients and the processes involved in obtaining court orders.

A family nurse practitioner and specially trained nurses provide ophthalmic care in and out of hospital and sometimes on a referral basis. The high incidence of diabetes and hypertension within the community, the risk of retinopathies and other eye diseases resulting from these conditions, and glaucoma make monitoring and surveillance necessary. There is a monthly eye clinic for the diagnosis and follow-up of these high-risk groups.

An audiology technician provides weekly service. Audiology screening tests are done as part of the ma-

ternal and child health and school health programs, with some service to the elderly.

District nurses make home visits to persons of all ages; 2,777 home visits were made by district nurses in 1990. In addition, district medical officers visit health clinics on a weekly basis to see community members who are ill and those referred by the district nurse. In 1990, there were 5,335 consultations, 3,662 by adults and 1,673 by children.

Admission rates at Glendon Hospital per 1,000 population were 140, 124, and 124 in 1988, 1989, and 1990, respectively, based on 1,646, 1,462, and 1,661 total admissions during those years. The average length of stay was 5.3 days in 1988, 6.8 days in 1989, and 4.3 days in 1990. The bed occupancy rate was 40.0% in 1988, 42.3% from January to September 1989, and 35.8% in 1990. By April 1990, about two-thirds of Glendon Hospital had been temporarily repaired after the damage inflicted by Hurricane Hugo, and 40 to 50 beds had been made available; however, for most of 1990, other than the special eye surgery program, most surgical cases were emergencies.

The laboratory department at Glendon Hospital is managed by a senior laboratory technician who is assisted by three laboratory technicians. In 1988, 1989, and 1990, a total of 12,595, 15,915, and 16,917 laboratory tests, respectively, were performed. Of the 48,427 tests performed during the 3-year period, 10.9% were in bacteriology, 31.6% were in biochemistry, and 57.5% were in hematology.

The X-ray department is managed by a senior radiographer. The services in this department have been greatly improved with the installation of a new X-ray film processor. In 1990, 1,605 examinations were performed on 1,521 patients.

The pharmacy department is managed by a senior pharmacist and two pharmacists; it supplies pharmaceuticals to hospitals for inpatients and outpatients, to district health clinics, and to the Margetson Memorial Home.

The physiotherapy department is staffed by a physiotherapist, and its services include therapy for hospital inpatients and outpatients, handicapped children, the elderly, and some community-based work with housebound patients.

Environmental Services

The main components of the environmental health program are solid waste management, vector control,

pest control, food hygiene, water quality monitoring, environmental health education, and sanitation.

Littering, indiscriminate dumping, and irregular collection schedules are serious obstacles to proper solid waste management. Refuse is transported across Plymouth to a dump site at White's landfill on the eastside of the island. Operation of this site as a sanitary landfill falls short of accepted standards, mainly because it lacks proper equipment and fencing, and access is difficult.

Despite the enactment of a public health ordinance in 1981, there is still no legislative support for solid waste management. In collaboration with the health promotion unit, plans are under way to implement community education programs on garbage disposal.

In terms of vector control, *Aedes aegypti* is receiving priority attention, and efforts are being made to develop sustainable, community-based, integrated strategies for vector control. A pilot project targeting source reduction was launched in the Kinsale area. The program's main thrust involves community education and active community participation in vector control. An islandwide inspection was carried out between January and June 1992—5,960 houses were inspected and 703 were found to have *Aedes aegypti* breeding, for a household infestation index of 11.8%. This figure represents a decrease from previous 1990 indices, which recorded a high of 23.7% and a low of 16.0%.

The increasing rat population poses a problem for farmers and potentially threatens the public's health. A poisoned-bait program was carried out in all government buildings, institutions, and key areas of Plymouth.

Regarding food hygiene, 170 food establishments have been registered. Routine inspections of food establishments and premises are carried out, but there are no regulations to enforce compliance with sanitary requirements; initial steps have been taken to draft food hygiene regulations. Food handlers receive training, and activities dealing with cholera prevention have intensified.

Most of the island's water supply (80%) comes from springs around Center Hills and Soufrière Hills, with an average daily flow of 13 million gallons; the remainder comes from wells. The fact that some individuals have unauthorized access to the spring source is a matter of concern. In Plymouth, 67.5% of households have piped water, as do 31.5% in Saint Georges. The Montserrat Water Authority is responsible for water distribution and monitoring of water quality. No bacteriological analysis of water has been done by the health department since Hurricane Hugo damaged equipment in September 1989.

Montserrat has no sewerage system. Sewage and excreta are disposed of in septic tanks and pit latrines; 16% of the population is not served by septic tanks or pit latrines and 67.1% of households in Plymouth and 30.1% in Saint Georges have flushing toilets. Public conveniences, many of which are in varying stages of disrepair, are used in many localities around the island. There is a program to assist householders erect pit latrines by providing seats.

Health Promotion

A health promotion unit was established in April 1991, and a health promotion officer was appointed to coordinate the educational components of the various health programs. The appointments of a nutrition officer and an AIDS/STDs coordinator have strengthened health education.

The health promotion program strives to create a greater understanding of health and family life issues and to provide learning experiences that will enable individuals to live healthy lives. The health team approach is used to identify educational needs and to integrate educational activities with target population groups.

The health promotion unit collaborates with other sectors, community groups, and nongovernmental organizations. Its priorities include promotion of cholera prevention activities in collaboration with the environmental health department; assistance with the implementation of a special project of *Aedes aegypti* control; and collaboration with AIDS/STDs project staff in a special drive to improve blood donor registration and general education activities.

The establishment of health promotion groups at the district level is being considered, in order to ensure better coordination of activities in the communities, to strengthen community action, and to give closer attention to priority concerns and needs.

Available Resources

Human Resources

Senior staff from the health department prepared a health personnel policy in early 1989, which became the key element for the reorganization and the development of strategic plans for the health sector.

Other than a nursing school that trains students to be professional nurses, midwives, and nursing assis-

tants, Montserrat has no educational institutions for health personnel. Health personnel other than nurses receive training in regional and other institutions. There is a private medical school on the island, but no Montserratians are enrolled.

Students also get some specific clinical experience in regional health institutions. The Montserrat School of Nursing is linked with George Brown College in Toronto, Canada, and receives support in the form of equipment and supplies. Health personnel participate in staff development programs both locally and overseas.

In 1992, available health personnel included 1 surgeon, 3 medical officers, 38 registered nurses, 14 student-graduate nurses, 18 nursing assistants, 5 environmental health officers, 1 dental surgeon, and 4 dental nurses and dental assistants. Externally funded positions were: 1 AIDS coordinator; 1 secretary to the AIDS/STDs program; and 2 technical cooperation officers (1 medical and 1 administrative). The position of director of health services was vacant in 1992.

Financial Resources

Health expenditure in 1991 was EC\$ 5,692,224 (13.3% of the total government budget), compared to EC\$ 4,599,624 (12.0%) in 1990, although extrabudgetary resources are available to the health department as part of the post-hurricane rehabilitation effort. In 1992, the estimated budget for the health sector was EC\$ 5,594,720. Revenue collection continues to be unsatisfactory, and arrears are outstanding from 1986. In 1991 revenue contributed only 3.4% to health expenditure.

In 1991, salaries and wages accounted for 71.0% of health expenditures.

In addition to the Government's budgetary allocations for the health sector, at least EC\$ 341,147 were received in 1992 from external donors as development funds. Some of the projects financed by these funds were rehabilitation of the nurses' home in Cudjoe Head, purchase of a mobile X-ray unit, and the family life education youth development project.

NETHERLANDS ANTILLES AND ARUBA

The Netherlands Antilles and Aruba are part of the Kingdom of the Netherlands. The Netherlands Antilles include the islands of Curaçao, Bonaire (Leeward Islands), Saba, Saint Eustatius, and Saint Martin (Windward Islands). The Leewards are located near the northwestern coast of Venezuela, and the Windwards are situated about 900 km northeast, near Puerto Rico. Saint Martin's northern portion is a French territory. In 1986, Aruba split from the Netherlands Antilles, and obtained a "separate status" from the Kingdom of the Netherlands for a period of 10 years. The total area of the Netherlands Antilles is 803 km²; Curaçao accounts for 444 km², Bonaire for 288 km², the Dutch part of Saint Martin for 37 km² (the French area is 52 km²), Saint Eustatius for 21 km², and Saba for 13 km². The island of Aruba extends for approximately 194 km². All the islands have considerably autonomous local administrations, and each has its own budget and parliament. The Netherlands Antilles has a central government that coordinates the activities of the local governments and is responsible for administering most of the resources devoted to health care. Responsibility for defense, foreign policy, enforcement of human rights, legal stability, and financial and administrative regulation rests with the Kingdom of the Netherlands.

NETHERLANDS ANTILLES

GENERAL HEALTH SITUATION AND TRENDS

The Netherlands Antilles are governed under a parliamentary democracy. The seat of government is in Curaçao, and the central government comprises a Governor, a Prime Minister, and seven Ministers. Each

island has its own executive and legislative council, and each island's government is charged with various responsibilities, including health, sanitation services, and environmental policy.

The principal economic activities of the Netherlands Antilles are oil refining (on Curaçao), tourism, commerce, and fishing. Curaçao also has a significant amount of light industry.

Although the economy underwent a crisis between 1985 and 1989, it began to recover in 1990, with economic growth fueled in large part by an increase in revenue from tourism. Average per capita income in 1991 was US\$ 7,800.

According to the 1992 census, the economically active population (EAP) represented 46.3% of the total population, and overall unemployment was 15.3%, with rates ranging from 4.2% on Saba to 16.9% on Curaçao. Unemployment on Saint Martin increased from 8% of the EAP in 1981 to 12.5% in 1992. School attendance is not compulsory. For all the islands except Saint Martin, for which figures are unknown, the proportion of the population with fewer than 4 years of schooling is under 5%.

The 1992 census indicated that the total population of the Netherlands Antilles was 189,474. Curaçao has 144,097 inhabitants; Saint Martin, 32,221; Bonaire, 10,187; Saint Eustatius, 1,839; and Saba, 1,130. The demographic situation differs markedly from island to island. Curaçao's population in 1992 had decreased 2.2% from the figure reported in the 1981 census. Saint Eustatius and Saba, on the other hand, experienced population increases of between 16% and 35% during the period between censuses (1981–1992), while Saint Martin's population expanded 145% during the same period, basically due to a large influx of illegal immigrants—most from islands such as Haiti and the Dominican Republic in the Latin Caribbean—who constitute 24.8% of the population. Only 30.4% of the population of Saint Martin was born on the island.

The proportion of the population aged 0–14 years is approximately 27%, and the proportion aged 65 or older is 5%. On Saint Martin, 26% of the inhabitants are under 15 years old, while 2.9% are 65 years old or older. On Curaçao, the birth rate in 1990 was 21.5 per 1,000 population. Life expectancy is 72 years for men and 76 years for women.

Mortality

The crude death rate was 8.2 per 1,000 population in 1988 and 8.1 in 1989, a sizable increase over previous levels (5.6 per 1,000 in 1986 and 6.0 in 1987). As for causes of death, diseases of the circulatory system (ICD-9, 390–459) rank first, followed by malignant neoplasms (140–239) and conditions originating in the perinatal period (760–769), which accounted for 39.5%, 17.1%, and 12.2%, respectively, of deaths with a defined cause in 1989.

SPECIFIC HEALTH PROBLEMS

The 1992 census included eight questions concerning health. The first was: How would you rate your health compared to that of other persons your age? Of the respondents, 2.4% rated their health as poor or very poor, 10.2% rated it as fair, and 87.2% considered their health good or very good. The percentages rating their health as poor or very poor were practically the same on all the islands.

There are no regularly functioning systems for disease-reporting. The laboratory network serves essentially as an alarm system for many infectious problems, since it carries out all related laboratory tests.

Analysis by Population Group

Perinatal, Child, and Adolescent Health

On Curaçao, Bonaire, Saba, and Saint Eustatius almost all births take place in health institutions. Exact figures are not available for Saint Martin because many illegal immigrants opt to give birth on the French side of the island in order to ensure that their children will have French nationality. In 1988, infant and perinatal mortality were 20.1 and 33.7 per 1,000 live births, respectively.

In 1990 Curaçao had 3,109 registered births. Of 2,876 newborns, 22.9% suffered from low birthweight.

The rates varied significantly depending on the institution in which the births occurred: 5.4% of the babies born at the Maternity Clinic had low birthweight, whereas 16.6% of those born at the General Hospital were underweight. This difference can be partly explained by the fact that the Clinic caters to more affluent patients, but the Hospital, as the referral unit, receives the highest-risk cases.

Birth and death figures for Saint Martin are unknown. Judging from a comparison of several figures from the census with those of the registry of vital statistics, there appear to be many reporting and coverage problems. In 1991, for example, 285 births were registered, but according to the census there were some 900 inhabitants under 1 year of age. The situation may be the reverse on the French side, since many children whose births are registered in order to automatically receive French citizenship may not necessarily stay there to live.

Immunization coverage among children under 1 year old, according to a survey conducted on Curaçao in 1991, was 95.3% for DPT, 82.0% for poliomyelitis, and 70.6% for measles. Coverage levels on the other islands are not known. Coverage on Saint Martin is assumed to be considerably lower for the reasons cited above. Public health services administer the oral polio vaccine, but many private clinics use the injectable vaccine.

Coverage for well-baby care among children under 2 years old registered with some service is 96% on Curaçao.

Health of Adults and the Elderly

The percentage of the population aged 65 or older is 8.6% on Bonaire, 8.1% on Curaçao, 9.0% on Saint Eustatius, and 14.7% on Saba, contrasted with 2.9% on Saint Martin.

These age profiles, together with the differences in living conditions, the presence of large numbers of illegal immigrants, and infrastructure and basic sanitation problems, are the distinguishing features of the epidemiologic profile of Saint Martin. On other islands, the main health problems are noncommunicable chronic degenerative diseases. Obesity, cardiovascular diseases, respiratory diseases (Curaçao), and diabetes are all serious problems. Based on data from hospital patient records, the prevalence of diabetes on Curaçao is estimated to be more than 4.9%.

A small-scale study carried out on Curaçao showed 67% of the population to be somewhat overweight,

with a Quetelet index (QI) above 25, while 29% were found to be overweight, with a QI of over 30.¹

Health of Women

According to the Family Planning Foundation of Curaçao, in 1991 there were 9,813 visits by persons requesting contraceptives. Oral contraceptives are the most widely used method (55.2%).

In 1991, a total of 12,358 Pap tests were carried out in the Netherlands Antilles (compared to 12,711 in 1990) among a population of approximately 52,000 women aged 25–64 years. In 1991, the Cancer Foundation recorded 10 cases of cancer of the uterine cervix and 40 cases of breast cancer.

Diseases and Health Impairments

Communicable Diseases

In general, communicable diseases are not a serious health problem in the Netherlands Antilles. There are no known cases of leprosy, Chagas' disease, schistosomiasis, onchocerciasis, leishmaniasis, or cholera. In 1991, one imported case of malaria was reported, and there were 36 positive laboratory tests for tuberculosis (compared to 17 in 1990). Also in 1991, 109 cases of bacillary dysentery and 375 cases of salmonellosis, including paratyphoid fever, were reported to the Department of Public Health and Environmental Sanitation.

Dengue is endemic on Curaçao and Bonaire, and periodic epidemic outbreaks are reported. One such outbreak occurred in 1993, with circulation of serotype 2 virus. No cases of dengue hemorrhagic fever and no deaths have been recorded.

As of 15 August 1992, a total of 110 cases of AIDS had been reported in the Netherlands Antilles, including 3 perinatal cases and 38 cases in women. Testing has revealed 507 HIV-infected persons, although estimates of the National AIDS Commission put the number at more than 2,000; the problem is most severe on Saint Martin and Curaçao. The National Commission estimated that the average direct cost per patient, from the time the infection is detected until death, is US\$ 28,000, and there are other,

indirect costs associated with work force losses. If all 2,000 infected individuals go on to develop AIDS by the year 2000, the total direct cost will be approximately US\$ 56 million.

Some indirect evidence indicates that AIDS prevention campaigns are beginning to have an effect: in 1991, the laboratory reported 2,861 cases of syphilis versus 4,325 in 1990, a decrease of 33.8%, although more tests were carried out in 1991 than in 1990. One cause for concern is that, depending on the origin of the case, between 11% and 20% of the *Neisseria gonorrhoeae* strains have been found to be penicillinase-producing, while between 11% and 46% are not penicillinase-producing but are resistant to other antimicrobial agents.

Cardiovascular Diseases

Diseases of the circulatory system accounted for almost 40% of all deaths in 1988 and 1989. Ischemic heart disease (ICD-9, 410–416) was the underlying cause of almost half the deaths from cardiovascular causes, followed by diseases of pulmonary circulation and cerebrovascular diseases. In recent years, a trend has been observed toward increasing frequency of cardiovascular disease among women. In 1989, 43.9% of female deaths and 35.4% of male deaths were due to cardiovascular causes.

Malignant Neoplasms

There are no data on the incidence of malignant neoplasms; the only available data relate to mortality from this cause. The most frequent sites of malignancy are the digestive organs (31.5%), the genitourinary organs (28.6%), and the respiratory system (14.5%), with significant differences between men and women. Among men, 20.1% of deaths with a known cause are from cancer; among women, the figure is 13.9%. With regard to the site of the malignancy, in women the respiratory system is affected in only 4.1% of cases, but in men the figure is 21.2%, making this the second most frequent site. Breast cancer accounts for 19.6% of all cancer cases in women.

Risk Factors

According to the 1992 census, 20% of the population aged 15 years old or older smoked (29.6% of the men

¹Country Paper of the Netherlands Antilles for the International Conference on Nutrition. FAO/WHO—Rome, Italy. December 1992.

and 11.4% of the women) and 3.5% drank alcohol daily (6.2% of the men and 1.0% of the women).

An increasingly serious problem on all the islands is illegal drug use. In 1991, law enforcement authorities requested 1,383 laboratory tests for cocaine (compared to only 58 in 1981); the number of positive samples has not been revealed. For marijuana and hashish, the number of tests requested increased from 172 in 1981 to 332 in 1991.

A sizable proportion of the cases of acute and chronic respiratory disease on Curaçao occur among persons living on the part of the island that is continually exposed to emissions from the oil refinery smokestacks, because the winds always blow from the northeast.

Based on the 1992 census, the housing situation is good to very good in the Netherlands Antilles, except on Saint Martin. Between 89% (Saint Eustatius) and 97% (Curaçao) of the dwellings have piped drinking water; on Saint Martin the proportion is only 64%. Excrescent disposal facilities are adequate in 97%–98% of the dwellings on all the islands except Saint Martin, where the figure is 79%. With regard to the structure of the dwellings, on Saint Martin 20% are in poor condition and 11% in very poor condition; on Saint Eustatius, 13% are in poor condition and 5%, very poor; on the other islands, the percentage of housing in good condition ranges from 89% on Saba to 92% on Curaçao and 95% on Bonaire.

There are no serious sanitation problems, except on Saint Martin. According to a recent report (see footnote 1), on this island the growth in the number of inhabitants (temporary) has outpaced public sector growth, the public services cannot satisfy current demand, and the infrastructure (highways, sewerage, etc.) has not been sufficiently developed to meet the high standards of the influx of tourists or provide adequate services to the island's population. Wastewater is discharged into unlined septic tanks that frequently are located too close to houses and the water seeps into the soil. With heavy rains, these septic tanks overflow.

A serious problem for all the islands, particularly given the space constraints, is solid waste disposal. For many years, solid waste has been dumped into the sea with almost no treatment.

The Windward Islands are in the path of hurricanes and at various times have suffered heavy human and material losses. Over time, Saint Martin has developed very good emergency plans, although when buildings are constructed the possibility of major hurricanes is often not taken into account, as occurred with the construction of the new hospital in Phillipsburgh.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

The social services provided by the Government of the Netherlands Antilles through the islands' departments are quite extensive. Persons with no income receive subsidies from the Department of Social Services for water and electricity, and are provided with free medical coverage. On Curaçao, 13,000 people receive such benefits. In addition to the subsidies, social services provide full medical coverage for persons whose monthly income is under US\$ 339 and partial coverage for those whose income is under US\$ 847. The social security system also assists the elderly, the homeless, and the disabled, in addition to supporting community centers, helping the young to find employment, and running employment and retraining projects.

Organization of Services

Most physicians and other specialists in the Netherlands Antilles receive their training in the Netherlands. Health services are funded by the central government, the governments of the islands, the social security system, private agencies, and insurance companies. The central government finances health services for public employees and their families and for retired persons.

The entire population has access to medical services. On Curaçao, more than 50,000 persons have an indigent card ("pro-paupere card kaart") that entitles them to free health services. Health spending in the Netherlands Antilles is oriented more toward curative than preventive care.

The central health institutions are the Ministry of Public Health and Sanitation, which coordinates all the activities of the sector; the Department of Public Health and Environmental Sanitation, which is the central government agency responsible for monitoring and promoting public health; the laboratory network; and the Office of Pharmaceutical Affairs.

Each island has primary care, dental, mental health, environmental protection, and ambulance services, as well as services for young people. Hospitals, polyclinics, maternity clinics, and other health institutions, whether private or public, are managed by nonprofit foundations. Other private foundations operating on some of the islands are the Family Planning Foundation; the Foundation for Persons with Cardiac Problems, Cancer, Diabetes, and Chronic Renal Problems;

and the Yellow and White Cross Foundation, which is responsible for many preventive activities for children, including vaccination, well-child care, and others.

Total health sector spending rose from about US\$ 105 million in 1983 to approximately US\$ 150 million in 1990, reaching close to US\$ 790 per capita. Health spending represented approximately 10.2% of the gross domestic product, and this percentage is rising; preliminary estimates indicate that it will exceed 12% in 1993.

Available Resources

There are 1,436 hospital beds in the Netherlands Antilles, representing approximately 7.6 beds per 1,000 population, in addition to 634 beds in homes for the elderly. The availability of resources varies considerably from island to island. Curaçao has 1,277 of all the hospital beds, or 87% of the total 1,436, for a rate of approximately 8.6 beds per 1,000 population; it also has 495 beds in homes for the elderly. The system of reference and counter-reference works well, and patients are transferred according to their needs. Cases that exceed the system's capabilities are referred to centers with more resources in Puerto Rico (for the Windward Islands) or to Venezuela, the United States, or the Netherlands. All costs in these cases are borne by the government.

Dental care resources are less developed than medical care resources. The group with the indigent card has a single dental clinic that provides basic treatment and refers patients to private clinics for prostheses and orthodontic work. The average waiting period for an appointment is 5 months. Pensioners receive dental care under the plan approved by the Department of Health, but the total cost cannot exceed US\$ 1,264 every 5 years.

There are 273 physicians (1.4 per 1,000 population), 234 of whom work on Curaçao, and 62 dentists (0.33 per 1,000 population)—54 on Curaçao, 4 on Bonaire, and 4 on Saint Martin. The ratio of university-trained nurses to physicians is approximately 2:1. The majority of physicians are educated in the Netherlands. For some specialties, physicians may complete part of their residency at the General Hospital of Curaçao. There are 31 pharmacies staffed by 31 pharmacists. Most (27) are on Curaçao.

In 1992 the Department of Health conducted a study² for the comprehensive planning of human re-

source training for 1992–2000, with a view to eliminating personnel surpluses and shortages in certain occupations and giving priority attention to critical areas.

ARUBA

GENERAL HEALTH SITUATION AND TRENDS

Aruba's structure of government is similar to that of the Netherlands Antilles, but it has no regional governments. The island's economy depended for many years on the operation of an oil refinery; however, that refinery closed in the mid-1980s, which had severe repercussions on the local economy. The economy entered a new phase in 1988, with an increase in tourism, and in 1991 the refinery went back into operation. The gross domestic product (GDP), which in 1991 was US\$ 453.6 million, climbed to US\$ 1,136.5 million in 1992. In real terms (constant 1987 values), GDP growth during this period was 89.7%; per capita GDP in 1992 was almost US\$ 12,900.

In 1991, 46.7% of the total population was economically active, and overall unemployment was 6.1%. Levels of schooling are high: 87.1% of the population aged 15 or over has a primary school education (5 or 6 years of schooling) or more.

The total population of Aruba was 66,687 according to the 1991 census. The population has increased in recent years, due largely to immigration that has occurred as a result of economic growth. Approximately 24.4% of the inhabitants fall into the age group 0–14 years old, while 7.1% are 65 years old or older. Some 10.8% of the inhabitants are foreigners, 40% of whom came from the Dominican Republic, Colombia, or Venezuela. The birth rate in 1990 was 17.1 per 1,000 population

Mortality

The crude death rate was 6.4 per 1,000 population in 1990, and has ranged between 5.4 and 6.4 per 1,000 since 1985. Communicable diseases cause 7.5% of all deaths from defined causes. The two leading causes of death are diseases of the circulatory system and malignant neoplasms. In 1990, 38.0% of all deaths were due to diseases of the circulatory system (ICD-9, 390–459) and 22.1% to malignant neoplasms (140–239).

²Discussie Nota Beroepskrachtenplanning 1992-2000. Willemstad, Curaçao, 1992.

In 1990, the Department of Public Health conducted a study³ to determine the population's perceptions of general health conditions on the island, use of services, and people's degree of satisfaction with the care they have received. Of the respondents, 12.3% rated their general state of health as poor, either all or some of the time (7.8% of male respondents and 16.0% of the females). In the group aged 65 years old or older, 42.9% said their health was poor all the time (20.0%) or part of the time (22.0%).

The most frequently mentioned health problems were hypertension, diabetes, and back problems. Hypertension and diabetes were cited most frequently by the lowest-income group; for hypertension, the figure was 11.1% in the high-income group and 15.0% in the low-income group, and for diabetes, 1.4% and 6.5%, respectively. Diabetes is a serious health problem, with a prevalence of approximately 4.9% in the total population and more than 20% in the group aged 65 or older.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal, Child, and Adolescent Health

In 1991, 97% of all births took place in health care institutions. The percentage of cesarean births was 19.6%, and the total number of live-born infants was 1,140. The late fetal death rate was 7.0 per 1,000 live births in 1989, and infant mortality was 4.5 per 1,000 live births in 1989 and 7.3 per 1,000 in 1990.

Vaccination coverage was 80% for the third doses of DPT and polio (Salk) in children under 1 year old, and 70% for MMR in children under 18 months.

Well-child care coverage is high. Of the 1,140 live-born children in 1990, 94% (1,070) were registered with the Yellow and White Cross Foundation, which is responsible for immunization and monitoring of growth and development in children. Of these children, 82% were seen by medical professionals on a regular basis during the first year of life, with an average of 7.5 visits per child. Children who have not been fully immunized are vaccinated when they enter school, which ensures almost 100% coverage for DPT and polio.

Illegal drug use among young people is a growing concern, but no figures are available on the extent of the problem.

³*Inquiry into the State of Health, 1990. Oranjestad, Aruba, 1991.*

Health of Women

The general fertility rate in 1990 was 95.3 per 1,000 women aged 15–49. No information is available on family planning programs.

In 1991, 4,845 Pap smears were performed in a total population of approximately 15,000 women 15–64 years old. In 1990 there were 14 deaths from breast cancer and 4 from cancer of the uterine cervix, which, taken together, represented 23% of all cancer deaths for both sexes and all age groups.

Diseases and Health Impairments

Communicable Diseases

Except for sexually transmitted diseases, communicable diseases do not pose a serious health problem on Aruba. In the last few years, several cases of tuberculosis have been reported, mainly among workers who have immigrated recently to work in the oil refinery or in construction; seven cases were reported in 1992.

The last outbreak of dengue occurred in 1981. In 1992, two dengue cases were detected, but there were no outbreaks.

The first cases of HIV infection were detected in 1986. Between that time and 31 October 1992, 68 infected persons were reported. Twelve of those people have developed AIDS. All the infected persons are 25 or older; they are divided about equally between men and women.

Syphilis was practically under control by the mid-1980s. In 1990, 133 cases were reported, and in 1991, 249, mainly among construction and refinery workers.

Major campaigns to educate the population about AIDS and other STDs were launched in 1991.

Cardiovascular Diseases

Cardiovascular diseases are the most serious health problem on Aruba. In 1989 and 1990, a disease of the circulatory system was the underlying cause in almost 40% of all deaths with defined causes, for both sexes.

Although the proportion of deaths from diseases of the circulatory system is about the same for men and women, the proportion of deaths from ischemic heart disease is 41% for men but only 24% for women; cerebrovascular diseases account for 30% of deaths among women but for only 23% among men.

Close to 20% of the population aged 45 years or older reported hypertensive problems in the survey conducted in 1990.

Obesity is a serious health problem, especially among women, but accurate figures are not available on the extent of the problem by age group.

Malignant Neoplasms

Malignant neoplasms are the second leading cause of death (22% of male deaths and 20% of female deaths). The most frequent sites of malignancy are the breast and the digestive system in women, and the digestive system and prostate in men. In 1989 and 1990, malignant neoplasms of the digestive system accounted for 25% of all cancer deaths, malignant neoplasms of the genitourinary organs for 22%, and malignant neoplasms of the respiratory and intrathoracic organs for 16%.

Oral Health

An epidemiologic study conducted among schoolchildren found 34% to be free of dental caries. The DMF (decayed, missing, and filled teeth) index in children under 12 is 2.9. Most schoolchildren show a fair DMF index of 1 to 1.2 in Oranjestad and of 3.0 to 6.0 in Savaneta; the latter is one of the areas with the poorest living conditions.

Risk Factors

The most important risk factors are associated with noncommunicable chronic degenerative diseases—eating habits, obesity, sedentary lifestyles, hypertension, etc.

No major natural or industrial disasters have occurred on Aruba during the last decade.

Housing conditions are quite good, based on the classification used by the census. According to the 1991 census, only 3.4% of the housing was in “very poor” condition, and only 7.6%, in “poor” condition. Many of the dwellings that fell into these categories are occupied by temporary construction workers. Practically all (97.7%) of the dwellings have adequate excreta disposal facilities. Wells or rainwater cisterns are the water source for 7.4% of the dwellings; the remainder have facilities for piping in water from the public system, which draws water from the sea and processes it in a desalination plant. All (100%) the dwellings are supplied with electric power.

Final disposal of solid waste is a problem for which there is no easy solution, given the island’s very limited area and extremely high population density.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

The operational structure of Aruba’s health system is similar to that of the Netherlands Antilles. Between 1987 and 1990, spending on health care amounted to between 7.7% (1987) and 5.9% (1989) of the gross domestic product. In 1990, per capita health care spending was approximately US\$ 810. The Government is endeavoring to establish a general insurance program to unify the health financing system.

Organization of Services

The existing health facilities are adequate for most of the population’s needs; patients with problems that exceed the capabilities of the system are referred outside the island (to Curaçao, Venezuela, the United States, or the Netherlands, depending on the problem).

The Ministry of Public Works and Public Health coordinates the entire sector, and the Department of Public Health is responsible for management and planning. The Department has divisions of social psychiatry, sanitation, communicable diseases, health care for schoolchildren, oral health, veterinary public health, health education, and research. It also operates a laboratory, an occupational health center, and the Saint Nicholas Medical Center. Other health facilities are administered by nonprofit foundations.

In 1990, total spending on health by the Government was approximately US\$ 40 million, 25% of which was for the social security system, 38% for payment of direct health care costs for persons with the indigent card, and the rest for direct expenditures of the Ministry.

One of the areas in which spending has increased most markedly in recent years is that of pharmaceuticals, the cost of which rose 63% between 1988 and 1991. In the latter year, spending on drugs accounted for almost 16% of total health spending. Total expenditure on hospitalization (excluding drug costs) amounted to 30% of the total, and operation of the laboratory represented 7%.

Available Resources

Aruba has one general hospital with 301 beds, a medical center with 20 beds, a home for the elderly

with 236 beds, and a psychiatric unit with 40 beds. The medical center serves emergency cases and performs 1.5% of all deliveries. There are approximately 4.8 beds per 1,000 population (between the hospital and the medical center).

The island has 78 physicians, 35 of whom are specialists, and 19 dentists.

In addition to the physicians and dentists, the hospital has 575 employees (1.9 per bed) in 1990. A total of 10,015 patients were hospitalized that year, with an average length of stay of 10.6 days. The occupancy rate

was 88.5%. In the medical center, there were 10,050 doctor visits in 1990.

The Yellow and White Cross Foundation, with 292 employees, accounted for less than 1% of total health spending in 1990.

The 1990 health survey (see footnote 3) found that in the previous year 72.8% of the respondents had consulted their family doctors (56.5% in the high-income group, 73.5% in the middle-income group, and 77.2% in the low-income group), and more than 87% were satisfied with the care they had received.

NICARAGUA

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

Nicaragua is bordered on the north by Honduras and on the south by Costa Rica, and it has coasts on both the Atlantic and Pacific Oceans. Its surface area of 135,811 km² represents nearly one-third the total area of Central America. The country's topography divides it into three geographical regions: the Pacific region, the mountainous central region, and the warm, humid Atlantic region. The health risks fostered by high mean temperatures, relative humidity, and rainfall translate into high morbidity from respiratory diseases.

Nicaragua's location on the Pacific "rim of fire" makes it vulnerable to earthquakes and volcanic eruptions. At the same time, its extensive jungle area makes overland communication difficult. Changes in the weather pattern sometimes cause droughts that have a severe impact on agriculture.

Economic Policy

Nicaragua is a developing country. It has been characterized as having an open, small-scale, low-income economy. The agricultural sector is its productive axis.

The dynamic impetus given to the social sectors at the beginning of the 1980s led to impressive reductions of illiteracy and mortality, but the improvements could not be sustained under the pressure of the civil war, the economic crisis that has plagued the country since the mid-1980s, and the structural adjustment measures undertaken to reverse inflation and the deterioration of the national economy. All these factors carried a high social cost.

The gross domestic product (GDP) experienced an average annual decline of 1.8% during the period 1980–1989, which, together with the rapid growth in population, resulted in a 36% reduction in per capita income by the end of the period.

A new economic and social model was implemented following the 1990 election. At that time the GDP

growth rate stood at -4% per year compared with 1989, and in June 1990 inflation had reached 880%. The external debt came to US\$ 10,000 million; as of mid-1990, \$3,500 million of this amount was in arrears and 44% of the total corresponded to interest owed.

The central focus of the Nicaraguan Government's economic adjustment program, in addition to fixing the exchange rate and implementing a restrictive monetary and credit policy, has been to reduce overall public sector expenditure to a level that could be financed by regular income, external donations, bilateral loans, and credits from multilateral institutions.

According to official figures, in 1991 the GDP grew in real terms by 0.4%, with a decline in per capita GDP of -2.9%. However, the International Foundation for Global Economic Challenge claims that the real GDP growth was in fact -0.6%. The annual inflation rate was 3.9%.

Exports amounted to US\$ 233 million and imports came to US\$ 818 million, for a trade deficit of US\$ 585 million. Of the nominal GDP of US\$ 1,681.8 million, external cooperation accounted for US\$ 800 million (47.6%). In this highly indebted country, the per capita debt of US\$ 2,600 far exceeds the annual per capita income of US\$ 407. Manufacturing, which in 1992 represented 24% of the GDP, declined by 5% with respect to 1991. Land area under cultivation was reduced by nearly 90,000 *manzanas* (a *manzana* equals approximately 0.7 hectares). The disappointing economic situation extended to the external sector, which did not meet its projected targets. The prices of Nicaragua's chief exports are depressed on the international market, and the medium-term outlook for some of these products, such as cotton and sugar, is not very encouraging.

Social Policy

Since 1990 the Government's economic policy has sought to correct both the macroeconomic imbalances and the structural problems in the economy. In 1993 the Government was hoping to achieve a growth in GDP of 2.1%—still less than the growth rate of the population (3.3%).

The percentage of GDP being channeled into social expenditures increased from 31.4% in 1991 to 37.8% in 1992. Health and education represented 90.4% of total social expenditure in 1992, leaving 2.5% for housing and 7% for other budget items. It should be pointed out, however, that in per capita terms social investment declined.

The poorest 70% of the population receives only 36.7% of the total income. Poverty most severely affects women, children, and youths. In 1992 the indigent population represented 20.7% of the total population and received an annual per capita income equivalent to US\$ 180. People living in conditions defined as "extreme poverty" (17.2% of the population) had a per capita income of US\$ 268.80. The group categorized as "poor," representing 30% of the population, received an annual per capita income equivalent to US\$ 412.80.

In 1993 the Government undertook to create 33,900 jobs, both directly and indirectly. However, since 45,000 persons were seeking employment for the first time that year, there was a net increase in unemployment. Of the general population seeking work for the first time (the youth labor force), 64% cannot find jobs. Among the population living in extreme poverty and looking for work for the first time, 84% are unable to obtain employment.

The social policy's design has been overshadowed by the economic adjustment policy, and priority has been given to the search for mechanisms to optimize social expenditure, with focus on where the money is being spent and on revision of the system of subsidies.

Social emergency funds have been established to compensate for declining incomes in the poorest groups. In addition, self-help programs are being promoted and community work projects are becoming an increasingly important strategy in the war against poverty. At the same time, the Government is carrying out various short-term programs to alleviate poverty, among them the Social Investment Fund, the National Reconciliation and Rehabilitation Program, the Action Fund for Oppressed Sectors, the Jobs for the Community Fund, and the Cooperative Production Program.

Deconcentration and decentralization of State action in the social area is the cornerstone of the new approach to social policy. The Government has adopted a more technical, managerial, and consistent approach, abandoning the paternalistic role of a welfare state that had characterized its social policy in the past. For example, it is considering charging for certain health and education services, bearing in mind the limited capacity of the poorest sectors to pay.

For the efficient administration of external assistance, which represents 39% of total public financing

for health and 9% for education, the budgeting and auditing mechanisms need to be strengthened.

Within the framework of overall restructuring of the State, which has involved redefining functions, optimizing resources, and reducing staff, there has been a strong trend toward transferring certain public services (social security, education, health, water supply, and transportation) to the private sector. At the same time, efforts are being made to incorporate representatives of the private sector into social initiatives.

Population

In the last 13 years the population grew 51.9%, from 2.7 million in 1980 to 4.1 million in 1992. The annual growth rate was 3.3%, which in absolute terms meant an average yearly increase of approximately 140,000. The urban population grew 78.6%, from 1.4 million in 1980 to 2.5 million in 1992, while the rural population only increased 23.1%, going from 1.3 million in 1980 to 1.6 million in 1992. In this latter year the population density was 34 inhabitants per km². Urban dwellers represented 61.6% of the total.

The population is not evenly distributed; it is largely concentrated in the Pacific region, which, although it makes up only 15.3% of the national territory, is home to 61.5% of the total population and 76.4% of the urban population. The central region, with 33.9% of the national territory, has 32.6% of the population, most of which is rural. The Atlantic region, which represents 50.9% of the national territory, only has 5.9% of the population.

In terms of age distribution, in 1992, 45.4% of the population was under 15 years old, 51.8% was aged 15 to 64, and 2.8% was aged 65 and over. Women represented 49.8% of the total population and men, 50.2%. There were slightly more women in urban areas (51.1%), while men were in the majority in rural areas (52.1%).

Life expectancy at birth increased from 48.5 years during the period 1960–1965 to 66.2 years during 1990–1995. In rural areas life expectancy is almost 10 years lower. It is higher for women than for men. The estimated birth rate for 1990–1995 is 38.7 per 1,000 population, and the fertility rate is 5.01 children per woman.

In October 1992 it was estimated that 626,106 persons, or 15.3% of the total population, had been affected in some way by the war: 354,365 (57%) were displaced, 61,472 (9.8%) were war veterans, 38,947 (6.2%) were direct victims of the conflict, and 171,322 (27.3%) belonged to groups that had been repatriated by the

TABLE 1
Leading causes of registered mortality in Nicaragua, 1990 and 1991.

| | 1990 | | 1991 | |
|--|--------|-------|--------|-------|
| | Number | % | Number | % |
| All causes | 14,691 | 100.0 | 12,641 | 100.0 |
| Diseases of the circulatory system | 2,616 | 17.8 | 2,540 | 20.1 |
| Intestinal infectious diseases | 2,166 | 14.7 | 1,196 | 9.5 |
| Accidents and violent causes | 1,689 | 11.5 | 1,678 | 13.3 |
| Diseases of the respiratory system | 1,621 | 11.0 | 1,325 | 10.5 |
| Certain conditions originating in the perinatal period | 1,241 | 8.4 | 1,115 | 8.8 |
| Malignant neoplasms | 984 | 6.7 | 1,009 | 8.0 |
| Other causes | 4,374 | 29.8 | 3,778 | 29.9 |

Source: Ministry of Health, National Division of Statistics and Information (DINEI).

Office of the United Nations High Commissioner for Refugees (UNHCR) or served by the International Commission for Action and Verification of the Organization of American States (CIAV/OAS). Of the total of 38,947 direct victims of war, 16,548 (42.5%) were orphaned, 2,936 (7.5%) were widowed, and 5,755 (14.8%) were disabled.

Mortality

Underregistration of mortality is believed to be as high as 50%. On the basis of the 1985 Sociodemographic Survey, general mortality has been estimated at 10.1 per 1,000 population. The leading causes of death in 1990 and 1991 were diseases of the circulatory system, intestinal infectious diseases, accidents and violence, diseases of the respiratory system, and certain conditions originating in the prenatal period (Table 1). Intestinal infectious diseases, which ranked second in 1990, fell to fourth place as a result of measures taken in the campaign against cholera.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

Infant mortality in Nicaragua has been declining steadily. In 1978 it was estimated at 93 per 1,000 live births, and by 1983 it had declined to 73.0 per 1,000. The 1985 Sociodemographic Survey estimated an infant mortality rate of 71.8 per 1,000 live births.

Deaths in children under 1 year of age represented from 28.7% to 30.8% of all deaths during 1988–1990,

and 24.1% in 1991. The leading causes of mortality in children under 1 year are intestinal infectious diseases, certain conditions originating in the perinatal period, acute respiratory infections, congenital anomalies, and malnutrition (Table 2). In 1990, owing to an epidemic of measles, diseases targeted by the Expanded Program on Immunization were in fourth place.

In 1990 the leading cause of death in children under 1 year was acute diarrheal diseases, which were responsible for 1,633 deaths (36.5% of all infant deaths); this cause fell to second place in 1991 with a total of 847 (27.8% of all infant deaths). Reports for the first third of 1992 showed that the downward trend was continuing.

Conditions originating in the perinatal period ranked second among the leading causes of infant mortality until 1991, when this group moved to first place. The principal causes of perinatal mortality are respiratory distress syndrome (258 deaths in 1990 and 307 in 1991), intrauterine hypoxia, other respiratory conditions in newborns, and infections specific to the perinatal period.

In the years 1988–1991, deaths in the 1–4-years age group numbered 689, 687, 1,027, and 722, respectively. In 1990 there were 246 deaths due to diseases targeted by the EPI (24% of all deaths in this age group) and 170 deaths from acute respiratory infections (an increase of 46.6% over 1989). During these 4 years deaths from malnutrition accounted for 4.6% to 5.5% of all deaths.

In 1991 the population aged 5 to 14 years made up 28.2% of the total population, but mortality in this age group represented only 3.5% of all registered deaths. Nevertheless, in this group the mortality problem is significant because of the causes: in addition to persistence of some of the communicable diseases (accounting for 31.3% of the deaths), there have been increases in the mortality from accidents and violence (30.2%) and degenerative diseases (10%).

TABLE 2
Leading causes of registered infant mortality in Nicaragua, 1988–1991.

| Groups of causes | 1988 | 1989 | 1990 | 1991 |
|--|-------|-------|-------|-------|
| All causes | 3,840 | 3,871 | 4,479 | 3,047 |
| Intestinal infectious diseases | 1,439 | 1,545 | 1,633 | 847 |
| Certain conditions originating in the perinatal period | 1,371 | 1,054 | 1,223 | 1,137 |
| Acute respiratory infections | 381 | 458 | 532 | 392 |
| Congenital anomalies | 184 | 253 | 203 | 192 |
| Malnutrition | 82 | 88 | 92 | 68 |
| EPI diseases | 10 | 4 | 305 | 54 |
| Other causes | 373 | 469 | 491 | 357 |

Source: Ministry of Health, National Division of Statistics and Information Processing (DINEI).

Adolescent and Adult Health

The leading causes of mortality among persons 15–44 years of age are external causes (accidents and violence) and chronic degenerative diseases.

In 1991 mortality in the group aged 45 years and over represented 47.1% of all deaths. The leading causes of mortality in this age group were cerebrovascular disease, acute myocardial infarction, diseases of pulmonary circulation, and other diseases of the heart.

Health of Women

In 1984 the official figure for maternal mortality was 4.7 per 10,000 live births, but there is considerable underregistration of maternal mortality. In 1988 a rate of 8.7 per 10,000 was calculated on the basis of indirect data, and in 1990 reports for the country as a whole led to an estimate of about 10 per 10,000 live births.

For several years, the Ministry of Health's yearbooks and chronological reports only gave institutional death rates, which varied from 95 in-hospital maternal deaths per 100,000 live births in 1983 to 73 in 1987, with a peak of 106 in 1985. Since 1988 the rates reported have included deaths occurring both in institutions and at home.

In 1991 the Master Health Plan estimated that maternal mortality in the country averaged around 15 per 10,000 live births. This figure was based on data from the National System of Vital Statistics (SINEVI) and includes corrections for underregistration as well as adjustments for general mortality rates estimated by the National Institute of Statistics and Census (INEC).

The causes of maternal mortality are mainly disorders associated with the second half of pregnancy, in-

cluding hemorrhage, hypertensive disease of pregnancy, and sepsis, although abortion is also recorded as a significant cause. The chief factor influencing the problem is that risks associated with reproduction are high for Nicaraguan women, a fact reflected in the large number of children per woman and high age-specific fertility rates in women under 19 and over 35. Teenage pregnancies represent 23% of all pregnancies.

Workers' Health

Data from the Nicaraguan Social Security and Welfare Institute (INSSBI) indicate that during 1991 a total of 53,473 paid workdays—the equivalent of 148 person-years—were lost due to 3,307 workplace accidents and 81 episodes of occupational diseases. These figures, it should be pointed out, correspond to only those accidents and diseases reported to the social security system. In the first half of 1992 INSSBI registered a total of 1,969 workplace accidents and 60 episodes of occupational diseases.

Social security coverage in Nicaragua is extremely low; out of an economically active population estimated at 1,256,000, only some 400,000 (17.1%) are in the formal sector of the economy, and only 215,000 of these workers (53.8%) are affiliated with the social security system.

Diseases and Health Impairments

Vector-borne Diseases

Annual registration of malaria cases for the period 1989–1992 shows a decline in the number of cases and

the annual index of blood slides, as well as an increase in the proportion of cases due to *P. falciparum* relative to those caused by *P. vivax*.

In 1992, 90% of malaria cases were concentrated in areas covered by 10 of the 19 comprehensive local health systems. Of those cases due to *P. falciparum*, 92% were concentrated in the areas served by seven of the local systems, indicating deterioration with respect to the presence of *P. falciparum* malaria, which has increased even though the total number of malaria cases has declined. In 1992 there were 23 deaths directly related to *P. falciparum* malaria, a reduction of 51% with respect to the previous year, when 47 such deaths were reported. The age groups most affected by *P. falciparum* malaria in 1992 were children from 1 to 4 years of age, who accounted for 61% of the cases, followed by the group aged 15 to 34, with 37%.

Since the 1985 outbreak of classical dengue, which caused 17,483 cases linked to serotypes 1 and 2, the disease has been endemic in Nicaragua, especially in Managua and León, where 659 presumed cases were reported in 1989, 4,137 in 1990 (with 4 deaths), and 1,885 in 1991, 12 of which were classified clinically as dengue hemorrhagic fever. A total of 559 cases with hemorrhagic signs and symptoms have been reported in León and Managua since October 1992, and there have been four deaths from the hemorrhagic form (three in León and one in Managua). For the first time, virus isolations have revealed that serotype 4 is in circulation. The incidence nationwide is estimated at 119 per 100,000 population. Only about 10% to 15% of the recorded cases have been confirmed in the laboratory, and hence one of the components of epidemiologic surveillance that needs to be improved is laboratory confirmation through a sampling system.

Vaccine-preventable Diseases

The incidence of these diseases (poliomyelitis, measles, whooping cough, diphtheria, and tetanus) has been on the decline in the last decade. The last case of poliomyelitis was reported in 1982, and the last diphtheria case in 1987. Whooping cough and measles continue to be endemic, with variable interepidemic periods.

In recent years the incidence of measles has declined as a result of intensive vaccination efforts. However, the impact of these efforts has been limited by the failure so far to achieve over 95% coverage, which is necessary to interrupt transmission of the virus. The last epidemic occurred in 1990, causing 18,225 cases (37% in the population over the age of 10) and 772 deaths.

Measles represented 6% of mortality from all causes at the national level. An intensive campaign in response to that epidemic achieved vaccination coverage of 82% of all infants under the age of 1 year.

There has been a sizable drop in reported cases of neonatal tetanus, from 90 cases in 1980 to 15 in 1990 and 9 in 1992. During 1992, activities designed to increase vaccination coverage with two doses of tetanus toxoid were redoubled throughout the country, with priority focused on areas previously identified as being at high risk. In addition to the community leaders and members of health brigades, lay midwives were trained and enlisted in the effort.

Cholera and Other Intestinal Infectious Diseases

According to the National Institute of Vital Statistics, in 1990 there were 2,166 reported deaths from diarrhea, 75.6% of them in infants under the age of 1 year. In 1991 the campaign against cholera brought a 45% reduction in deaths from diarrhea relative to 1990, and in those under 1 year the reduction was 48%.

The first case of cholera was reported in November 1991, and by February 1992 the disease had assumed epidemic proportions. By April of that year the occurrence of cases had accelerated sharply; it reached a peak in July, when 350 cases were reported. By December 1992 the cumulative totals were 3,067 cases and 46 deaths. Between January and 17 April 1993 another 524 cases and 24 deaths occurred.

Chronic Communicable Diseases

In 1990, 2,944 cases of tuberculosis were recorded; in 1991 the figure was 2,797 and in 1992, 2,811. Of these cases, 56.5%, 58%, and 62%, respectively, corresponded to the pulmonary type. In 1992 two cases of tuberculous meningitis were reported in children under the age of 5.

The prevalence of leprosy stood at 0.65 per 10,000 population as of May 1992. This rate represented 239 cases in areas covered by 11 of the comprehensive local health systems. Forty-five percent were in Managua, 27% in Chinandega, and 10% in León.

Respiratory Diseases

In 1990 a total of 1,621 deaths were attributed to respiratory diseases, and in 1991, 1,325. This cause group

ranked fourth among the leading causes of mortality in 1990 and third in 1991. The age groups most affected were infants under 1 year and persons over 50.

Pneumonia was the reported cause of 1,110 deaths in 1990, of which 48% were in infants under 1 year. In 1991 there were 243 fewer deaths from this cause than in 1990 (a reduction of 22%) and 329 fewer deaths in infants under 1 year, for a reduction of 38.1% relative to the year before.

AIDS and Other Sexually Transmitted Diseases

Underregistration of sexually transmitted diseases may be as high as 50%. Nevertheless, a comparison of cases reported at the national level during the period 1982–1986 with those reported during 1987–1991 showed slight increases in cases of chancroid, condyloma acuminatum, and gonococcal infection. On the other hand, the data revealed a slight decline in cases of congenital syphilis, acquired syphilis, and lymphogranuloma venereum.

Cases reported in 1991 yielded the following rates per 100,000 population: chancroid, 5.3; condyloma acuminatum, 10.2; congenital syphilis, 0.07; acquired syphilis, 6.8; and gonococcal infection, 75.3.

The first cases of acquired immunodeficiency syndrome (AIDS) were reported in 1987. Of the total of 40 cases of AIDS recorded between 1987 and the first half of 1993, 77% were between the ages of 25 and 44 and 90% were males; 32 of these patients have died. The number of individuals known to be infected with HIV increased from 56 in 1990 to 76 in 1991, 89 in 1992, and 101 in the first half of 1993.

Nutritional Diseases and Deficiencies

A national height census conducted in first-grade children in 1986 showed that almost one-fourth (23.9%) of the schoolchildren between the ages of 6 and 9 had some degree of malnutrition: moderate in 19.1% and severe in 4.8%. In 1989 a second anthropometric survey of schoolchildren, conducted as part of a study on goiter, revealed that the proportion of 6–9-year-olds with retarded height had declined to 18.7%.

The nutritional surveillance system began operating in 1989. According to data from the system, the incidence of low weight-for-age malnutrition in children under 6 years participating in the growth and development monitoring program was 35.8% in 1990, 33.7% in 1991, and 32.2% in 1992.

An assessment of goiter prevalence, conducted in 7,938 children ranging from 6 to 14 years of age, was undertaken in 1989 prior to reactivating the salt iodination program. It revealed a national prevalence of 3.9%, but the problem was more serious in the Pacific area, where 20.4% of female children over the age of 10 were affected.

Cardiovascular Diseases

A total of 2,389 deaths from cardiovascular diseases were recorded in 1989, 2,220 in 1990, and 2,479 in 1991, representing rates of 63.8, 59.3, and 61.2 per 100,000 population, respectively. Of these deaths, cerebrovascular diseases accounted for 33%, diseases of pulmonary circulation and other diseases of the heart for 32%, and acute myocardial infarction for 23%.

Malignant Neoplasms

A total of 894 deaths from malignant neoplasms were reported in 1988, 955 in 1989, 844 in 1990, and 983 in 1991. The most frequent sites in 1991 were the cervix uteri (174), stomach (146), leukemia (78), trachea, bronchus, and lung (56), and female breast (48).

Accidents and Violence

In 1988 there were 1,111 reported deaths from accidents and 1,044 from violent causes; in 1991 these figures were 1,014 and 615, respectively. The mortality rate from accidents and violence declined from 59.5 per 100,000 in 1988 to 40.2 in 1991.

Behavioral Disorders

Little information is available on the frequency, distribution, and type of mental disorders among the general population. A multicenter study conducted in 1990 found that the prevalence of mental disorders encountered during general medical consultations in urban areas ranged from 2.2% to 3.9%, which equaled 98 cases (56 of them registered) out of 2,487 consultations.

An analysis of discharges from the psychiatric hospital in Managua in 1988, 1989, and 1990 indicated that schizophrenic psychosis ranked first with respect to number of hospitalizations, accounting for more than 50% of the total for the 10 leading causes. It was fol-

lowed by other nonorganic psychoses, affective psychosis, disorders due to alcohol consumption, and neuroses.

Risk Factors

Risks in the Physical Environment

Drinking Water and Other Water Resources.

Broadly speaking, the supply of drinking water is sufficient to meet the population's needs. According to 1980 estimates by the Nicaraguan Institute of Natural Resources and the Environment (IRENA), the country has potential water resources on the order of 149,820 million m³, 90% of which are surface water and 10% groundwater. As of that year, an estimated 1,800 million m³ were being utilized, of which 350 million m³ went for the production of hydroelectric energy, 1,150 million for the irrigation of agricultural lands, 27 million for industrial purposes, and 87 million for drinking water. Despite its abundance, the distribution of the water relative to the location of human settlements poses difficulties in supplying water to many population groups, particularly in the central and northern parts of the country.

The estimated production of drinking water in 1990 was on the order of 150 million m³. During the 1980s there was a slight increase in the utilization of surface water, which rose from 27% in 1980 to 30% in 1990. With regard to pollution of watercourses, IRENA reports that the quality of 38 rivers, two lakes, six lagoons, and the coastal waters is deteriorating owing to the discharge of untreated liquid and solid wastes from agriculture, industry, and mining and from populated areas in general.

During the period 1981–1992 coverage of the total population with water supply services increased by 57%. The urban population with water supply increased from 985,000 (67% coverage) in 1980 to 1,883,400 (74% coverage) in 1992, while in rural areas the increase was from 75,000 (6% coverage) in 1980 to 477,100 (30% coverage) in 1992.

Although most of the urban population is supplied with water through household connections, 23.4% are obliged to get their water from public standpipes. Most rural areas have neither public standpipes nor household connections.

Despite the progress achieved in terms of coverage and the responsible institution's efforts to operate and maintain the systems, approximately 980,000 people in urban areas—52% of the total urban population with

services—do not have a steady supply of water because of limitations in installed capacity and the poor condition of the water supply infrastructure, particularly in Managua, Matagalpa, and six other important urban centers.

In the last 10 years, maintenance work was performed on approximately 148 urban and municipal water supply systems. In 1990, 70% of the systems used groundwater as their source of supply, while the remaining 30% used surface water.

At the end of the 1970s, drinking water was being treated only in the cities of Managua and Matagalpa, where this practice has long been carried out, and in four other systems that had intermittent use of disinfection units. No form of treatment was being applied in any of the remaining 142 systems. In response to the cholera epidemic, efforts to treat and disinfect the water were intensified and 251 chlorination units were installed; these actions have brought chlorinated water to 80.5% of the urban population connected to a supply system. According to information from the regional laboratories of the Nicaraguan Institute of Water Supply and Sewerage Systems (INAA), of 12,718 bacteriological samples taken in 1992 from all the water systems under INAA management, 10,645 (83.7%) were negative for fecal coliforms.

Air and the Atmosphere. According to analyses undertaken by IRENA and the Ministry of Health, there are no serious air pollution problems.

Forests, Jungles, and Cultivated Lands. The progressive deterioration of natural resources in rural areas is alarming. The situation is due to several principal causes: the rapid advance of the agricultural frontier, the granting of lands for agricultural use in potential forest areas, the use of wood for household energy supplies, the lack of legislation governing land and natural resource use, and inappropriate cultivation practices.

Domestic and Industrial Wastes. Services for the collection and disposal of solid waste are provided in 69 of the 143 municipal seats, which translates into coverage of approximately 35% of the urban population. Assuming a daily output of 0.5 kg of solid waste per person, the urban population would generate about 1,272.5 metric tons of solid waste each day. If only 35% of this volume is being collected and disposed of, this means that 827 tons are not being removed from urban areas.

Final disposal of the waste collected is inadequate, since no criteria or techniques are applied to assess the

environmental impact of the sites selected as municipal landfills. Nor is solid waste disposal regulated: only 13% of the landfills have received public health clearance. Waste is dumped in the open air without any planning or control; it is left untreated and no efforts are made to reclaim or recycle.

No technical or public health standards are applied to the storage, collection, transport, or final disposition of hazardous solid waste, which includes chemical, toxic industrial, and hospital wastes, among others.

Sanitary Sewerage Systems

INAA is responsible for the management of 19 sanitary sewerage systems, only nine of which have their own treatment units (stabilization ponds). The lack of treatment and inadequate disposal of wastewater poses a serious hazard both for the environment and for human health. In Managua, for example, household and industrial wastewater is discharged into Lake Xolotlán without any treatment whatsoever.

During the period 1981–1992 the proportion of the urban population with sanitary sewerage service declined from 32% to 29.9%, even though the number of persons covered grew from 474,000 to 760,000.

From data gathered from an INAA/CARE project in June 1990 on a total of 12 sanitation projects, it has been estimated that approximately 5,475 latrines were installed between 1984 and June 1990 and that at least 12,100 more were expected to be installed in 1991–1993. Since the outbreak of cholera in Nicaragua, investments in the water and sanitation sector have increased. The Ministry of Health, with technical and financial cooperation from PAHO/WHO, UNICEF, and the Nicaragua Emergency Social Investment Fund, has provided approximately 57,000 latrines in rural and marginal urban areas in almost all the *municipios* of the country since the cholera epidemic began. There are no official data on current coverage of the population with latrines or other systems of excreta and wastewater disposal. The only information on the subject comes from a survey conducted in 1992 by the Nicaraguan Development Institute (INIFOM), which indicated that 55.7% of all dwellings have latrines.

Disasters

In recent years several natural disasters have ravaged the environment and affected the health of large segments of the population. Among the most important were Hurricane Joan in October 1988 (40,000 peo-

ple affected), the eruption of the Cerro Negro volcano in April 1992 (150,000 affected), and the tsunami that struck the Pacific coastal area in September 1992 (100,000 affected).

Housing

The results of a national survey conducted in 1992 by INIFOM give an overview of the status of housing and urban settlements. There are an estimated 621,926 dwellings in the country, of which 46.6% get drinking water from INAA systems, 21.5% from wells, 12.7% from rivers or lagoons, 15.5% from public standpipes, and 3.9% from cistern trucks. With regard to the disposal of excreta and household wastewater, 21.9% of the dwellings are connected to sanitary sewerage systems, 8.1% have cesspits or septic tanks, and 55.7% have latrines, while 14.2% have no system whatsoever.

Food Contamination

There are serious problems related to the production, processing, storage, distribution, and sale of food at lunch counters, street stands, hotels, and restaurants. Various sources agree that an average of 300,000 people each year suffer diarrhea as a result of eating tainted food. The incidence of other foodborne diseases is high: data from 1986 indicate a yearly average of 597 cases of bacillary dysentery, 4,712 cases of amebiasis, 1,798 cases of hepatitis, and 385 cases of typhoid fever. Dairy products illustrate the broader problem: although the condition of processed milk has improved, the same cannot be said of milk products. In 1989, tests on 36 samples taken in Managua revealed that fecal coliforms were present in 74% of the cheeses, 56% of the cream, and 15% of the butter. In addition, fungi and yeasts were found in all the samples of each of these products, and all the cheeses examined were adulterated.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

General Policies

External economic resources have been and continue to be enlisted within the framework of an increasingly

restrictive stabilization policy. Most of these resources go for funding of commercial and financial projects.

According to a 1992 survey, 97% of the population believes that in order to successfully rebuild the country all the sectors need to join forces and set aside political and economic differences. The people feel that a renewed joint effort can solve the country's main problems, but that without such a concerted effort, Nicaraguan society runs the risk of becoming even further polarized.

Population Policies

The Government wants to bring demographic variables into harmony with economic and social realities. With this goal in mind, it will promote sex education within the context of responsible parenthood, introduce family planning programs, and attempt to halt rural-to-urban migration by giving priority to social and productive services in rural areas.

Health Policies and Strategies

Institutional Organization and Management. Nicaragua's national health system is shaped largely by the activities of the Ministry of Health. This institution has an extensive network of care units, consisting of health posts, medical posts, health centers, and hospitals of varying degrees of complexity. Their operations are organized according to a set of standards governing their technical and leadership structure and guiding their development. Other institutions that also provide health services to groups or sectors of the population are the armed forces, the Ministry of Government, the private health sector, and nongovernmental organizations, each of which has its own regulations and independent practices.

In keeping with the primary health care strategy, the building and strengthening of comprehensive local health systems has been selected as the tactical and operational approach. These systems will strive to develop four main lines of activity—health care, management, training, and social participation—that are key to transformation of the health system. Ever since a ministerial resolution in 1991 laid the groundwork for the organization of comprehensive local health systems in the country, numerous steps have been taken to make this transformation viable.

Human Resources. The training model for personnel in comprehensive local health systems includes the

following strategies: training in the implementation of these services through a series of modular courses; revising the curricula for the health professions to include the concepts of primary health care and comprehensive local health systems, and strengthening the curriculum for specialization in public health; promoting the establishment of a degree program in nursing, with emphasis on maternal and child care, and providing training for higher-level nursing technicians; and increasing the ratio of nurses to physicians, as well as the number of technical personnel in relation to the total population and per service production unit.

Expenditure and Financing. As part of an initiative to reallocate funds, starting in 1993 the Government increased the amount allotted to the total health sector budget category by 2% per year. Other strategies include identifying alternative sources of internal funding and charging for services at the secondary care level, with the proceeds to be used to finance primary care; decentralizing the health services for the purpose of cost recovery, in order to finance rehabilitation and maintenance of the infrastructure as well as provide additional incentives for personnel; selling health services to the Nicaraguan Social Security and Welfare Institute (INSSBI) within the social security system; providing incentives to encourage participation by the private sector (commercial enterprises, nongovernmental organizations, churches, and communities) in the delivery of health services, with the resultant savings being applied to primary care; and carrying out studies on minimum staffing needs in order to reduce the payroll in all the health units.

Physical Resources. The policies in this area are focused on rehabilitating the infrastructure in order to attend to the social needs of target groups. Projects are already being carried out in the country's poorest *municipios*, and 459 subprojects in health and education have been approved that will reach 94% of the *municipios*. A program is under way to repair and update hospitals and other health installations. In this connection, US\$ 6 million has been made available by the Inter-American Development Bank to establish a hospital management system and modernize the management of 20 of the country's hospitals. A census of the health network infrastructure is planned in order to find out the condition of the installations and develop proposals for their rehabilitation, including specific costs.

Food and Nutrition. Efforts in this area are geared toward improving the nutritional levels of mothers

and children by providing milk every day to children enrolled in primary school and distributing food rations through communal dining halls. The target is to reach 450,000 children throughout the country. Other priorities are to reinforce sound nutritional practices, including breast-feeding and proper weaning, and to promote nutrition-related activities, such as treatment for internal parasites, in Ministry of Education pre-schools and primary schools. Pre- and postnatal feeding is provided for malnourished mothers and their children in 18 *municipios*. In addition, an effort is being made to establish better coordination among all the institutions that participate in nutritional programs.

Drinking Water and Sanitation. The environmental health strategies include improving and expanding the coverage of drinking water services and sanitary sewerage systems and latrines in rural areas and urban fringe areas; upgrading the quality of drinking water by repairing the distribution system as needed; establishing cost recovery mechanisms and maintenance systems to ensure sustained funding for INAA investment projects; and improving the collection and disposal of solid wastes; which will require building the administrative capacity of municipal governments.

Drugs and Biologicals. The goals in this area are to encourage development of the national pharmaceutical industry, to develop a national pharmacopeia, and to prepare purchasing and utilization lists of basic drugs, laboratory reagents, replacement parts and materials, instruments, equipment, and nonmedical supplies.

Organization of Services

Personal Health Care Services

The health system has two subsystems: the public system under the Ministry of Health (which oversees the health system), the Ministry of Government, and the armed forces; and the private system, which is controlled by juristic persons or organizations, both for-profit and not-for-profit.

The public sector covers most of the population, although since 1990 its coverage has declined while that of the private sector has grown. Care is provided for the entire population, with priority being given to high-risk groups such as mothers and children.

There are two levels of care: the first level consists of health centers with beds, health centers without beds,

health posts, medical posts, and base houses (houses of community members that are used to support health activities), and the second level corresponds to hospitals with varying levels of capacity, which are classified according to length of stay (acute versus chronic patients), the services they provide, and the areas they serve. The referral system is still not fully developed. The health services network has 1,033 units, of which 60 are hospitals (52 for acute patients and 8 for chronic patients).

Traditionally, the financing of health services has been the responsibility of the public sector. The contribution provided by external cooperation has varied in recent years depending on the social and economic situation of the country (9% in 1988, 32% in 1989, 9% in 1990).

Coverage. During 1988–1991 there were, on average, 5.5 hospital discharges per 100 population. In 1991 the bed occupancy rate was 63.1% and the bed turnover rate was 46.1, compared with rates of 70.1 and 49.6, respectively, in 1990. The average stay declined slightly from 5.0 in 1990 to 4.9 in 1991. As of May 1992, the bed occupancy rate that year was 64.3%, the average stay was 4.3 days, and the bed turnover rate was 22.4, which may indicate improved utilization of bed resources. In 1991 a total of 53,386 surgical interventions were performed, 52,905 of them in acute-care hospitals and 481 in health centers with beds. Of the total, 20,345 were elective procedures and 33,041 were emergencies. The national index of surgical interventions per 100 discharges was 23.4.

Medical consultations per inhabitant fell from 1.58 in 1990 to 1.24 in 1991 and 1.20 in 1992. Approximately 60% of all medical consultations were at the primary care level. Medical consultations for infants at both levels of care accounted for 32.2% of total consultations in 1990 and 32.6% in 1991. Infants under 1 year of age had the highest average number of consultations (4.3). Up until 1990 the delivery of nursing care remained relatively stable at 8.5 consultations per 1,000 population, but in 1991 the rate declined to 7.0. Dental visits declined from 0.10 per inhabitant in 1990 to 0.07 in 1991, mainly because of a shortage of dental supplies. The largest percentage of dental consultations corresponded to schoolchildren, followed by pregnant women and then preschoolers.

Laboratory tests per medical consultation increased slightly at both the primary and the secondary level between 1990 and 1991 (from 0.36 tests per consultation to 0.37). In the first 4 months of 1992 there were 0.4 laboratory tests being performed per medical con-

sultation at the primary care level and 0.9 at the secondary level. Laboratory tests per hospital discharge decreased from 12.5 in 1990 to 10.9 in 1991 and 10.4 in the first 4 months of 1992. The decline was due to insufficient supplies of laboratory reagents. The rate is high because it includes tests done at the health centers with beds and in emergency services. X-ray exams per hospital discharge declined from 0.16 in 1990 to 0.14 in 1991.

In 1990 the health services attended 83.4% of the projected number of pregnancies, and in 1991, 81.4%. Institutional delivery increased from 41% in 1990 to 46% in 1991, and the number of postdelivery checkups rose to 41,169 in 1991, which represented approximately 80% of the institutional deliveries.

Coverage of children under 1 year by the growth and development monitoring program increased from 93.6% of the target that had been set in 1990 to 104.7% in 1991. This increase was attributed to the establishment of a parallel supplementary feeding program, to which more mothers brought their babies. Coverage in children aged 1 to 5 years declined considerably, from 16.4% in 1990 to 13.6% in 1991. For this age group there are no nutritional programs to provide an incentive for participation in monitoring.

Immunization coverage of children under 1 year of age in 1991 and 1992 was 83% and 86%, respectively, for OPV; 71% and 74% for DPT; 54% and 73% for measles vaccine; and 75% and 81% for BCG. The low levels of coverage with the measles and BCG vaccines in 1991 were due to a worldwide shortage of these biologicals. A vaccine census was conducted in 1992 as a strategy for promoting systematic vaccination throughout the country. A team made up of health personnel and health brigade workers worked to record all persons who had been immunized, identify those with missing vaccinations, and gather information on the vaccination methods that were used to provide the doses.

Vaccination coverage of canines against rabies averages 9.6%, with large regional variations. In 1991 a total of 3,835 stray dogs were eliminated in the country.

Available Resources

Human Resources

It is estimated that the health sector work force declined by 2,352 between 1990 and 1991, and the numbers appeared to stabilize in 1992. These workers represented 1.83% of the total EAP in 1990, 1.58% in 1991,

TABLE 3
Ministry of Health personnel per 10,000 population,
by category, Nicaragua, 1990–1992.

| Category | 1990 | 1991 | 1992 |
|------------------------|------|------|------|
| General physicians | 5.08 | 4.10 | 4.17 |
| Specialized physicians | 1.74 | 1.83 | 1.93 |
| Dentists | 0.74 | 0.41 | 0.44 |
| Nurses | 7.4 | 5.5 | 5.3 |
| Nursing auxiliaries | 7.4 | 5.5 | 6.2 |

Source: Ministry of Health.

and 1.57% in 1992. In January 1993 there was a small increase of 614 positions, due in part to pressure exerted by students, universities, and the unions to make jobs available for graduates in the health professions.

The country has about 4,000 physicians, half of whom graduated in the last 12 years. During this same period approximately 1,200 medical professionals emigrated to other countries. Although the supply is rising, the number of physicians employed by the public services is stable at about 2,000, indicating that the professionals who are not hired by these services are working either in other public subsectors or, principally, in the private sector. The last year that the Ministry of Health guaranteed jobs to all the graduates from the various health specialty training centers was 1990. Table 3 gives figures per 10,000 population for various types of personnel working for the Ministry of Health.

With regard to the training of health personnel, the number of graduating physicians is on the rise, while the number of dentistry and nursing graduates has declined. There are currently 13 university establishments responsible for training health personnel at both the higher technical levels and the university degree level. Among these are the Health Polytechnical Institutes in León and Managua, each of which is associated with its corresponding national university. In addition to the degree program in nursing reopened in 1989 at the Polytechnical University in Managua (a private university), the Health Polytechnical Institute that is part of the National University of Nicaragua (Managua) started a 5-year degree program in nursing in 1990 which emphasizes training in maternal and child care. This latter institute also offers a 5-year degree program in laboratory science, a 3-year advanced technical program in health services administration, and advanced-level technical programs in nursing, physical therapy, laboratory science, and anesthesiology.

Financial Resources

The health budget as a proportion of GDP was the same in 1989 (5.0%) as it had been in 1980, having shown minor variations of about 1% in the course of the decade. It then declined to 2.78% in 1990 and 2.72% in 1991, but in 1992 it went back up to 4.6%.

The Ministry of Health's budget amounted to US\$ 131 million in 1989 but was reduced to US\$ 67.5 million in 1991. In 1992 it was US\$ 84.2 million (16.3% of the general budget of the Republic of Nicaragua) and in 1993, US\$ 80.2 million. In 1993, 48.8% of the health budget went to hospital care, 38.7% to primary care, and the remaining 12.4% to training programs, capital expenditures, and administration.

In the hospitals, 85% of the total budget goes for salaries, food, and medical supplies and the remaining 15% for nonmedical supplies and contractual services. At the primary care level, the amount allocated for medications and salaries comes to 90% of the total expenses and the allowance for food is minor.

Data from a PAHO study on the evolution of Nicaragua's health expenditures over the period 1980–1992, and projections to the year 2000, show that during the study period the expenditure was on the order of US\$ 190 million (in 1988 United States dollars) and represented (discounting extreme variations) between 7% and 8% of the GDP—a proportion that is now declining. Distribution by sectors has varied considerably. Since 1989 there has been greater participation by the private sector. Expenditures by enterprises, organizations, and charitable institutions have remained stable. During 1981–1988 the public sector accounted for about 70% of the national health expenditure, but from 1991 onward this proportion has been less than 60%.

The expenditure for outpatient care actually doubled between 1980 and 1992, reflecting a growing emphasis on activities at the primary care level, and in recent years this category has accounted for approximately 40% of the national expenditure on health. Hospital expenditures varied, but showed a rising trend in the later years of the period; they account for approximately 25% of national spending on health. The expenditure for drugs has fallen sharply.

The amount spent on outpatient care has risen faster in the public sector than in the private sector. Hospital care, on the other hand, has been declining in the public sector but increasing in the private sector. With regard to drugs, the national expenditure between 1980 and 1983 exceeded US\$ 40 million each year; in 1984, 1985, 1987, and 1988 it was slightly over US\$ 30 million; and in the remaining years of the period the figure was US\$ 25 million. The per capita drug expenditure was in excess of US\$ 10 throughout the period 1980–1985 and averaged US\$ 10.90 during the 1980–1992 study period, ranging from a high of US\$ 19.60 in 1981 to low of US\$ 6.80 in 1990.

Physical Resources, Equipment, and Supplies

In 1989 Nicaragua spent US\$ 20 million on drugs in the public and private health sectors combined. In 1990 the public sector spent approximately US\$ 33 million, but suffered a drug shortage estimated at 44%.

Liberalization of the drug market and abandonment of the policy of purchasing generic drugs triggered an increase in average prices in 1990 which, together with the decline in institutional supply, meant that a large sector of the population had less access to drugs.

PANAMA

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

The political crisis that began in Panama in 1984 and culminated with the events of 1989 spawned an economic crisis, which was manifested in changes in the gross domestic product (GDP). The growth rate, which had been stable for many years, began to decline in 1984 (4.7% for the period 1984–1985, 3.4% for 1985–1986, and 2.3% for 1986–1987), and became negative during the periods 1987–1988 (–15.6%) and 1988–1989 (–0.4%). Growth resumed in 1989–1990 (4.6%), 1990–1991 (9.3%), and 1991–1992 (8.0%). Declines were registered in all areas of the economy during the period 1987–1988, but those most affected were import duties and construction, which declined by 61.4% and 60.7%, respectively.

In real terms the GDP grew 9.3% in 1991 and 8.0% in 1992. Based on an index value of 100 for 1970, the following changes were observed in recent years: as a proportion of GDP, gross fixed capital formation declined from 275.6 in 1984 to 237.4 in 1989. The figures were 266.4 and 317.5 for 1990 and 1991, respectively. Spending on public administration was 388.7 in 1988, 305.7 in 1989, 307.5 in 1990, and 309.4 in 1991. Exports of goods and services decreased from 210.6 in 1987 to 191.8 in 1988, but rebounded somewhat to 200.2 in 1989, 203.2 in 1990, and 206.2 in 1991. Imports of goods and services remained stable with only slight yearly variations.

Wholesale prices decreased from 202.4 in 1987 to 188.6 in 1988 and 193.2 in 1989 (price index of 100 for 1975), subsequently rising to 211.5 in 1990 and 212.1 in 1991. The decline, however, did not affect consumer prices, which changed very little (100.7 in 1989, 101.5 in 1990, and 102.8 in 1991; based on an index value of 100 for 1988). In 1992 inflation was 1.8%.

In current United States dollars, per capita income was \$2,489.5 in 1987, \$2,043.5 in 1989, and \$2,418 in 1992. However, in 1970 dollars those amounts equaled \$981.6, \$783.7, and \$896.6, respectively.

As of 31 December 1990, the country's cumulative external debt was US\$ 1,024.1 million in interest and fees and US\$ 1,920.5 million in principal, bringing the total debt to US\$ 2,944.6 million. As of 31 March 1993 the debt of the central government amounted to 3,771.6 million Balboas, of which 2,802.6 million corresponded to the external debt and 969 million to the internal debt.

Figures on the extent of poverty vary according to the source and method used to collect the data. Based on a 1983 socioeconomic study, it was stated in February 1991 that 37% of the population (730,309 inhabitants) was living in poverty. Approximately 20% of the total population was living in critical poverty and 17% was unable to meet basic needs; 70% of the population living in critical poverty resided in rural areas.

Estimates for 1988 based on household surveys indicate that 50% of the population was living in poverty. For 1989 there are two figures on family poverty. The better known figure put the proportion of families in poverty at 54.1%, with 31.6% critically poor and 22.4% poor. This figure was calculated by taking into account the earnings generated by primary and secondary occupational activities, as well as the earnings of other economically active persons, but excluding from consideration income earned from other activities and income of nonworking persons. Accordingly, this figure is more indicative of poverty-level wages than of overall poverty.

Application of the ECLAC methodology to the surveys yielded the following figures for 1989: 23% of families were critically poor and 23% were poor, for a total proportion of 46% of families living in poverty.

A document entitled *Empleo, ingreso y pobreza en Panamá* (Employment, Income, and Poverty in Panama) indicates that poor families are larger. The average family has 4.69 members (1.41 economically active); "non-poor" families have 3.62 members (1.44 economically active); "not extremely poor" families have 4.80 members (1.26 economically active); and "extremely poor" families have 4.69 members (0.89 economically active).

According to the Population and Housing Census of 1990, the economically active population (EAP) num-

bered 839,695 and was 71% male and 29% female. The labor force participation rate decreased from 50.1% in 1970 to 43.9% in 1980 and then rose to 47.5% in 1990. In comparison with 1970, the participation of young people (aged 15–19) in the labor force was lower in 1980 and 1990. This is attributable to longer school attendance, which tends to postpone entry into the labor force. Close to 40% of the women aged 20–59 were employed in 1990. The overall unemployment rate in 1990 was around 11.7%, as compared to 8% in 1980 and 9.7% in 1970. Relative figures indicate higher unemployment rates among women.

As for the distribution of the EAP by sector of economic activity, the primary sector employed 39.9% in 1970, 29.8% in 1980, and 27.4% in 1990; the secondary sector employed 15.1% in 1970, 17.8% in 1980, and 15.1% in 1990; and the tertiary sector employed 39.5% in 1970, 46.3% in 1980, and 53.0% in 1990.

By 1992 the EAP had grown to 920,541 persons, an increase of 7.2% over the previous year, and the unemployment rate had decreased from 16.1% in 1991 to 13.6%. A household survey conducted in August 1991 found notable signs of labor market recovery owing to the facts that the steady rise of unemployment had been halted and the private sector had resumed its role as the principal generator of productive employment.

In 1990, 10.7% of the population aged 10 and over (10.3% of males and 11.1% of females) was unable to read or write. The provinces of Panamá and Colón showed the lowest percentages of illiteracy (4% and 6%, respectively), while the San Blas region and the provinces of Veraguas, Darién, and Bocas del Toro registered the highest. Illiteracy was most prevalent among the population aged 60 and over (28.5%) and lowest among the group aged 10–29 (around 6%).

The proportion of the population with no schooling was 14.7% in 1980 and 9.9% in 1990, while the proportion with a university education increased from 5.6% to 8.6%. Between those same years, the proportion having completed secondary school grew from 26% to 33.5%, with a concomitant reduction in the proportion of the population with only a primary education, from 52.7% to 48%.

The 1990 census enumerated 598,908 dwellings, 87% of which were occupied. In 1990 there were 300 squatter settlements, in which 66,661 families resided (almost 16% of the total number of Panamanian families). The situation was critical in the Panama City metropolitan area, where 24% of families lived in 194 squatter settlements with no drinking water, sewerage, or refuse collection services.

Population

According to the 1990 National Population and Housing Census, Panamá had a population of 2,329,329, with an annual growth rate of 2.6% since the previous census in 1980. The average population density had increased during the intercensal period from 24 to 31 inhabitants per km². The province of Panamá, with 90.2 inhabitants per km², is the most densely populated, while the province of Darién, with only 2.6, is the least. Almost half (46%) of the total population is concentrated in the province of Panamá, which is also the area that receives the most migrants. Panama City, the largest urban center in the country, in 1990 had a population of 827,838. Another 16% of the total population lives in the province of Chiriquí.

The least densely populated provinces (Darién and Bocas del Toro) registered population growth rates of 5.2% and 5.7%, respectively, during the 1980s. In addition to high natural growth rates, these provinces experienced net immigration. Los Santos and the San Blas region, which are the least populous political-administrative units, had growth rates of 0.9% and 1.8%, respectively, during the decade. Both have shown a tendency to lose population. The proportion of the country's population residing in urban areas increased from 42% in 1969 to 54% in 1990.

Various ethnic groups are represented in the country. According to the 1990 census, the indigenous population totaled 194,269 (100,149 males and 94,120 females), or 8% of the total population. The Guaymies are the largest indigenous group (64% of the total), followed by the Kunas (24%), the Emberas (8%), the Bokotas (2%), the Wuananas (1%), and the Teribes (1%). The indigenous population is concentrated mainly in the provinces of Chiriquí (33%) and Bocas del Toro (29%), the San Blas region (16%), and the provinces of Panamá (9%) and Colón (8%).

In 1992 persons under the age of 15 made up 34.3% of the population. The median age increased from 19.3 in 1970 to 22.9 in 1993. The proportion of population aged 60 and over grew from 7% in 1980 to almost 8% in 1990. Fertility decreased from 3.76 children per woman in 1980 to 2.89 in 1991. The fertility rate for the 5-year period 1985–1990 was calculated at 3.14, and was lower in urban areas (2.46) than in rural areas (4.12). The provinces of Darién and Bocas del Toro had the highest fertility rates (5.93 and 5.01, respectively), while the province of Los Santos had the lowest (2.4). The overall birth rate was 29.5 per 1,000 population in 1980 and 25.8 in 1990; in urban areas the rate decreased

from 26.1 to 20.6 during this period, and in rural areas from 27.7 to 25.5.

The masculinity index in 1992 was 103.8, but it ranged from 123.4 in Darién to 91 in San Blas, owing to migration between provinces.

Mortality

Life expectancy increased from 70.07 to 72.72 years between 1980 and 1990. During the same period the general mortality rate was around 4 per 1,000 population. Underregistration was estimated at 39.0% in 1980 and at 27% in 1990. In the latter year the general mortality rate based on registered deaths was 4.0; the estimated real rate was 5.2. During the period 1985–1990 the adjusted rates were 4.5 for urban areas and 5.8 for rural areas. All the provinces except Panamá, where the rate was 4.12, exceeded the national average (Darién, at 7.82 per 1,000, had the highest rate).

Medical certification of deaths is estimated to have increased from 77.5% in 1970 to 79.4% in 1980 and 84.5% in 1990. In 1986, 98.2% of all deaths and 99.6% of the deaths of children under 1 year were doctor-certified in urban areas, while the corresponding proportions in rural areas were 64.3% and 74%. The proportion of certified deaths varies in the different regions of the country, especially in those in which the indigeneous population resides.

In 1990 the leading causes of death were cardiovascular diseases, responsible for 28.8% of deaths; malignant neoplasms, for 16.1%; and external causes (accidents, suicide, homicide, and other forms of violence) for 13.9%. These three cause groups accounted for 58.8% of all the deaths that year.

The infant mortality rate was 21.7 per 1,000 live births in 1980, 19.4 in 1986, and 18.9 in 1990. Based on an estimate of 32.8% underregistration, the adjusted rate for 1990 would be 25.1.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

Between 1986 and 1991 the birth rate decreased from 25.9 to 24.4 per 1,000 population. Infant mortality declined from 19.4 to 18.7 per 1,000 live births (25.1, adjusting for underregistration); neonatal mortality remained stable (11.5 in 1986 and 11.8 in 1991);

postneonatal mortality dropped from 7.9 to 6.8. In 1989, among all recorded term pregnancies, the proportion of low-birthweight babies (born at under 2,500 g) was 7.6% for males and 9.0% for females.

The leading causes of infant death in 1990 were certain conditions originating in the perinatal period (49%), followed by congenital anomalies (18%), ill-defined intestinal infections (7%), pneumonia (4%), and nutritional deficiencies (3%). These percentages were calculated on the basis of the total number of deaths, including those attributed to ill-defined causes (7.5%).

In 1990 the mortality rate among children aged 1–4 years was 13.6 per 10,000 children in this age group. The leading cause was diarrheal disease and the second leading cause was external causes. The top two causes accounted for 31% of these deaths.

The mortality rate among children aged 5–14 was 3.9 per 10,000 children in this age group. The leading causes of death were external causes (31%), malignant neoplasms (12%), and pneumonia (8%).

Adolescent and Adult Health

Adolescents (aged 15–19) make up 10.56% of the total population. Females suffer a higher health risk in this age group, since obstetric causes are one of the leading causes of death.

The marriage rate among adolescent males is 3.4 per 1,000, whereas among females it is 14.7 per 1,000. Twenty percent of all births in the country are to women under the age of 20.

Adults make up 47% of the total population. In the group aged 20–44 years, accidents, suicide, homicide, and violence together constituted the leading cause of death in 1988, with a rate of 0.6 per 1,000 persons in this age group; next in order of importance were malignant neoplasms, with a rate of 0.035, and cerebrovascular disease, with a rate of 0.034. Among persons aged 45–59, the leading cause was cardiovascular diseases (a rate of 1.9 per 1,000), followed by malignant neoplasms (1.55) and accidents and violence (0.875).

Health of Women

In 1992 life expectancy at birth for women in Panama was 74.93 years: 77.16 years for urban women and 72.24 for rural women.

The leading causes of death among women in 1989 were malignant neoplasms; cerebrovascular disease; acute myocardial infarction; accidents and suicide; and

homicide and other violence. In 1989 the uterine cervix and breast were the most common sites of malignant neoplasm. Breast cancer is becoming increasingly frequent, in particular among women aged 50–74, who account for 51.2% of all cases. In 1990 there were 29 deaths from complications of pregnancy, childbirth, and the puerperium (6 in urban areas and 23 in rural areas), making the maternal mortality rate 5.4 per 10,000 live births (2.3 in urban areas and 8.5 in rural areas). This rate represents a slight decrease from 6.0 per 10,000 in 1986.

For several years now, the primary mental health problems treated and reported among women have been neurotic disorders.

Health of the Elderly

Persons aged 60 and over make up 7.52% of the total population. The leading causes of death recorded among this group in 1989 were cardiovascular disease (a rate of 22.4 per 1,000 persons in this age group), malignant neoplasms (7.32 per 1,000), and accidents and violence (1.5 per 1,000).

Workers' Health

The leading health problems among workers are work-related accidents, occupational diseases, and pesticide poisoning. Employment of minors also constitutes a concern. According to a workers' health study carried out in 1989, occupational accidents and diseases have increased, as evidenced by the fact that while the number of active contributors to the Social Security Fund rose 62.2% between 1976 and 1985, the number of workers receiving disability payments rose 224.5% during the same period.

Diseases and Health Impairments

Vector-borne Diseases

The number of reported malaria cases totaled 1,115 in 1991 and 727 in 1992. Treatment coverage increased from 91% in 1991 to 96% in 1992. Of the cases reported in 1992, 84.5% were caused by *Plasmodium vivax*, 15.3% by *P. falciparum*, and 0.2% were mixed. The provinces of Darién and Chiriquí accounted for the largest proportions of cases (47.3% and 22.4%, respectively). Roughly the same proportion of cases occur in the

population under 20 years of age as in the population age 20 and over. In all age groups except that of children under 1 year, more males are affected, accounting for 62.5% of all cases.

No cases of dengue have been reported since 1942, although *Aedes aegypti* was reintroduced into the country in 1985 and up to 20% of surveyed households are now infested. The annual parasite index decreased from 1.4% in 1991 to 0.85% in 1992.

Sporadic cases of Chagas' disease are reported in rural areas. In 1991 the cumulative number of reported leishmaniasis cases was 1,217.

Vaccine-preventable Diseases

The last cases of poliomyelitis in the country were reported in 1972, and the last cases of diphtheria in 1981. The incidence of neonatal tetanus has been reduced and the high-risk areas have been identified; six cases were reported in 1991 and three in 1992. Although the incidence of whooping cough has declined, outbreaks continue to occur in hard-to-reach areas in some provinces; 107 cases were reported in 1991 and 26 in 1992, with case-fatality rates of 7.5% and 27%, respectively, in those years.

Measles occurs in increasingly widely spaced epidemic cycles. During the 1970s epidemics occurred every 2 or 3 years, but by the 1980s the cycle had lengthened to 4 years. During the most recent measles epidemic (1990–1991), a total of 4,079 cases were reported, the majority in children under 1 year (approximately 50% were in infants under 9 months of age). The incidence rate was 1,180 per 100,000 children aged 1–4 and 1,000 per 100,000 children under 1. In 1991 there were 8,838 reported cases of chickenpox and 3,972 cases of epidemic mumps.

Cholera and Other Intestinal Infectious Diseases

Cholera first appeared in Panama on 10 September 1991 in a rural community in the province of Darién. That year 1,178 cases, 29 deaths, and 292 hospitalizations were reported. In 1992 there were 2,416 cases, 1,260 hospitalizations, and 49 deaths. Hospitalization rates have ranged from 80% in the Metropolitana health region to 27% in the Panamá Este health region, while the case-fatality rate has ranged from 0% in the Metropolitana health region and Colón to 4% in Panamá Este. Eighty-seven percent of the cases and 82% of the deaths have occurred in the province of

Darién and the San Blas region, where cases continue to be reported. The most affected age groups have been children under 1 year and persons 50 and over.

Reported morbidity from diarrheal diseases increased among all age groups during the period 1986–1990, but decreased in the subsequent 2 years. In 1991 the epidemiologic surveillance system received reports of 93,629 cases (a rate of 1.18 per 100,000 population). Mortality from diarrhea among children under 1 year and children aged 1–4 years has remained stable at 97.0 and 22 per 100,000 children in those age groups, respectively.

Chronic Communicable Diseases

The incidence of pulmonary tuberculosis decreased from 43.1 to 18.2 per 100,000 between 1978 and 1984. It then climbed steadily from 1985 to 1992, reaching a rate of 33.0 per 100,000 (790 cases). The increase occurred in all age groups. Nevertheless, the clear-cut downward trend in tuberculosis mortality and case fatality continued between 1978 and 1990, with mortality dropping from 7.1 to 3.0 per 100,000 during that period.

A total of 133 cases of leprosy have been registered (a prevalence rate of 0.58 per 100,000 population). Of those cases, 61% were multibacillary and 39% were paucibacillary; 80% of those affected were older than 15. In 1991 and 1992 one new case per year was detected.

Respiratory Diseases

During the 1980s mortality from pneumonia and influenza decreased by approximately 50% among children under 1 year and children aged 1–4. In 1990 the death rate stood at 70.1 per 100,000 among children under 1 year of age, and this cause accounted for 4% of all deaths in this age group. Among children aged 1–4 the death rate was 11.3.

According to data on morbidity from acute respiratory infections reported by health services in 1990 and 1991, there were 15,203 and 14,967 cases, respectively, in those years among children under 5, with rates of 509.28 and 497.39 per 10,000 population. A Vitamin A survey among children aged 12–59 months revealed a prevalence of 44.6%. A study conducted by the Ministry of Health which looked at 517,569 visits to health services found that diseases of the respiratory system accounted for 56.9% of those visits. In 1991 the epidemiologic surveillance system received reports of 230,334 cases of acute respiratory infection (a rate of

9.52 per 100,000 population) and 119,006 cases of epidemic influenza (a rate of 4.9).

Rabies and Other Zoonoses

Human rabies has been controlled; no cases have been reported since 1973. No tuberculin reactors or tuberculous lesions have been found in either cattle or pigs in slaughterhouses since 1983. Porcine cysticercosis has not been found in any slaughterhouses in the last 10 years, and only two or three cases per year have been reported in animals raised by people in their yards or sold on the black market.

AIDS and Other Sexually Transmitted Diseases

Acquired immunodeficiency syndrome (AIDS) was detected for the first time in Panama in September 1984. As of 31 December 1992 a total of 406 cases had been confirmed, with a cumulative case-fatality rate of 61.3% (249 deaths). Up to 1989 the annual incidence was 32.49 cases per 1,000,000 population; in 1992 the estimated incidence was 28.6. The health regions most affected by AIDS are those located in the province of Panamá.

Sexual transmission accounts for the greatest proportion of cases (80%), and homosexual transmission for almost half (48%). Transmission through blood and blood products is responsible for 12.3% of the cases. Heterosexual transmission has increased steadily, while homosexual and bisexual transmission seems to have stabilized. The male/female case ratio was 14:1 in 1987 and 3:1 in 1991. The age groups most severely affected are adults 25–34 years of age and 35–44 years of age, among whom the rates are 68.0 and 74.8, respectively. The most frequently diagnosed opportunistic infection is pulmonary tuberculosis, which occurs in slightly over 17% of all cases.

The incidence of gonorrhea has declined substantially, from 418 cases per 100,000 population in 1984 to 122 in 1991. The incidence of syphilis decreased 49% during the same period.

Nutritional and Metabolic Diseases and Deficiencies

One out of every four children in Panama shows significant growth retardation by the age he or she enters school. The prevalence of malnutrition is 3.2 times higher in rural areas than in urban areas, and the problem is both more prevalent and more severe among in-

digenous children. The highest rates are found in San Blas (71.2%), Bocas del Toro (44.1%), Darién (39.9%), and Veraguas (38.1%).

A survey carried out in 1990 found the prevalence of goiter to be 13.2% among 3,062 schoolchildren examined. The prevalence was higher in the Azuero region (23.2%), where the salt consumed is not iodinated, than in the rest of the country (1.4%). A national survey conducted that same year studied 1,389 children aged 12–59 months. It found that the prevalence of deficient levels of serum retinol (<10 µg/dl) was zero, that of low levels (<20 µg/dl) was 6%, and that of Vitamin A deficiency (<30 µg/dl) was 29.4%. The overall prevalence of anemia was 18.6%, with higher rates in the group aged 12–23 months. Of all the children examined, 7.1% showed malnutrition (–2 standard deviations) as measured by weight-for-age, and 1% were malnourished according to weight-for-height.

A nutritional study of adults carried out in 1980 revealed that 22.8% of the males and 24.0% of the females were malnourished, and that 3.8% of the males and 7.7% of the females were obese (Quetelet index). Studies conducted by the Ministry of Health indicate that 72% of the adult population shows some degree of overweight.

Cardiovascular Diseases

Cerebrovascular disease is among the leading causes of death, with a rate of 34.8 per 100,000 population in 1990. Cerebrovascular disease, ischemic heart disease, and other forms of heart disease were responsible for an average of 2,400 deaths per year during the period 1986–1992. Surveys indicate that the prevalence of arterial hypertension is between 10% and 16% in Panama although there are pockets in some localities (Otoque, Chepo, and Taboga) in which it is as high as 40%. Hypertension is more prevalent among the population of Afro-Antillean origin, and is most common among males over the age of 35.

Malignant Neoplasms

Malignant neoplasms constituted the second leading cause of death in 1990. Among males, the most frequent sites of malignancy are the prostate, the stomach, and the trachea, bronchus, and lung. Among females, breast and cervical cancer are the most common types. During the period 1986–1990 the total cost of medical care for cancer patients was over US\$ 15 million.

Accidents and Violence

Transport accidents increased by 22% between 1991 (17,574 accidents) and 1992 (21,491). Of the 1992 accidents, 19,343 were motor vehicle collisions, most of them in metropolitan areas and in the Canal Zone, Colón, Chiriquí, and Chorrera. The rest were other types of accidents, including those involving pedestrians being struck by vehicles, vehicles overturning, and falls. In 1991 transport accidents caused 337 deaths. That number rose to 380 in 1992, with a male/female ratio of 5:1. The province of Panamá accounted for the greatest number of deaths from this cause, followed by Chiriquí, Colón, and Coclé.

The Institute of Legal Medicine saw 12,892 persons in 1992, 50.8% of whom were males. The leading cause for the provision of care was blunt object trauma (43.7%), followed by physical assault (27.7%), assault with a knife (3.54%), and assault with a firearm (2.87%).

Behavioral Disorders

In May 1992 a survey was carried out among patients treated in two hospital emergency rooms in Panama City during one day and among those incarcerated in detention centers. Of those interviewed, 4.5% of the emergency room patients and 15% of the detainees had used cocaine at some time in their lives, and 27% of the former group and 21% of the latter had done so in the previous 24 hours. Of the emergency room patients, 5.1% had used marijuana at some time, and 9.4% had done so in the previous 24 hours. Of the detainees, 14.2% acknowledged having used marijuana at some time, and 0.5% indicated they had done so in the previous 6 hours. The average age at which marijuana use began was 17, although 40% of those interviewed said they had started before the age of 15.

The prevalence of tobacco-smoking is 6% among adolescents, 25% among adults, and 33% among the elderly. Rates are highest among the population in the upper socioeconomic strata and with the most education, as well as among the rural population. Between 1989 and 1990 smoking increased by 23%.

Oral Health

According to the National Survey of Oral Health carried out between 1990 and 1991, 90% of schoolchildren had dental caries, both in deciduous and per-

manent teeth, and only 3.7% showed no signs of caries or gingivitis. The decayed, missing, and filled (DMF) index among schoolchildren aged 7–13 years was 2.8 deciduous teeth and 2.7 permanent teeth; it varied from 5.8 in rural areas to 4.7 in urban areas.

Risk Factors

Risks in the Physical Environment

Housing censuses indicate that 83% of the total population was being supplied with drinking water in 1990, and that coverage was 66% in rural areas and 100% in urban areas. In terms of quality, monitoring of the urban water supply showed average values of under 1 turbidity unit and a coliform bacteria count of 0 per 100 ml, whereas in rural areas the water quality is doubtful. In regions such as Darién and the Azuero peninsula there is a shortage of water fit for human consumption. The province of Panamá has water pollution problems as a result of the discharge of excreta and industrial substances. In the Bay of Panama, coliform bacteria counts of up to 160,000 colonies per 100 ml have been found.

No precise information is available on air pollution. Based on a 1987 study conducted in Panama City that applied the methodology of rapid assessment of pollution source, the daily average amount of total suspended particulates was over 100 $\mu\text{g}/\text{m}^3$. Smokestack industries are responsible for 70% of the particulate matter discharged into the atmosphere. The 125,000 vehicles in the country are the principal mobile source of air pollution, while factories that produce fish meal, cement, and lime and those that process clay, along with slaughterhouses, coffee-roasting plants, and some private refuse incinerators, are the principal stationary sources.

The National Institute of Renewable Natural Resources has estimated that the deforestation rate during the period 1970–1987 was 1.6% per year.

In 1990, 84% of the country's housing units had sewer connections, individual septic tanks, or latrines. In 1992, 75% of all urban and 40% of all rural solid waste was being collected. Of the solid waste collected, 60% is disposed of properly in urban areas, but only 10% in rural areas.

The dissemination of chemical substances in the environment is a growing problem. Contamination caused by pesticides has become a concern in the last 20 years since these chemicals began to be imported in large amounts for use in modern agriculture, espe-

cially rice production in the provinces of Chiriquí, Coclé, and Veraguas.

A study on poisoning conducted in 1989 at the Hospital de Santiago in Veraguas concluded that 37.3% of the 577 cases treated between 1984 and 1988 were due to pesticides. The pesticides causing the greatest number of poisonings were organophosphates (38%), bipyridil (22.8%), and carbamates (15%). The case-fatality rate was 23.4% among victims of organophosphate poisoning, 28.5% among persons poisoned by bipyridil, and 16.6% among those poisoned by organochlorine pesticides.

On 8 July 1992 in Divalá, Chiriquí, 4,000 liters of fungicide were accidentally discharged into the Chiriquí Viejo river, killing large numbers of fish. Other effects this accident may have had are unknown.

Studies on pollution in the Bay of Panama have demonstrated the presence of dissolved hydrocarbons in the ocean, both on the Pacific side of the Canal and in the areas adjacent to the Bay. Up to 87 $\mu\text{g}/\text{L}$ of hydrocarbons were found, and the principal focus of contamination was determined to be the port of Balboa.

Risks in the Work Environment

The most hazardous areas of activity, in addition to agriculture, are mining and quarrying, industry, construction, and supply of electricity, gas, and water. According to the 1990 census, 121,838 persons were employed in these areas.

Various incomplete studies have shown that workers suffer from a high incidence of diseases associated with unhealthy working and environmental conditions. A study conducted in 1990 among 203 refuse collectors employed by the Panama City Metropolitan Sanitation Department concluded that 65% had parasitic infections; of that total, 42.2% were infected with *Uncinaria*, 24.5% with *Giardia lamblia*, and 12.5% with *Strongyloides stercoralis*. The same study found that 39.4% of the workers did not use gloves or boots.

Natural Disasters and Industrial Accidents

Panama is located in a geographic area at moderate risk for seismic activity. The only significant earthquake so far this century occurred on 22 April 1992. It affected an area in the province of Bocas del Toro from the border with Costa Rica to the town of Chiriquí Grande. A total of 23 deaths and 559 injuries were re-

ported, 1,060 houses were destroyed, and 5,544 persons suffered damages; communications were also severely disrupted.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

General Policies

The Program for Economic Development and Modernization developed by the Ministry of Economic Planning and Policy in October 1991 states that the Government is committed to steering the country toward an improved quality of life for all Panamanians. It also points out that improved quality of life depends not just on higher income but on a number of other factors, including better education, cultural enrichment, better levels of nutrition and health, reduction of poverty, a healthy environment, equality of opportunity, and broad individual freedom.

The program emphasizes the need to enhance the market economy and underscores the crucial role of the private sector as the primary generator of productive activity, the importance of orienting the economy toward international trade, and the necessity of modernizing the State. Efforts at modernization include a plan for the privatization and reform of State-run enterprises, reform of public finance, development of a program of public investment, and updating of public management practices.

The country's economic policy calls for major changes in the agricultural, industrial, labor, and commercial sectors. In addition, it contemplates a tax reform and the development of multisectoral zones.

The Program of Public Investment, which establishes the increase in government spending over a 3-year period, attaches special importance to projects for the expansion and remodeling of hospitals and health centers, as well as the repair of schools, the purchase of equipment for health and education establishments, investment in construction, and restoration of the country's road infrastructure.

In order to give priority attention to meeting the basic needs of the population, a Social Assistance Program was created within the Development Program. The foundations of this program were set out in the documents *Estrategia Nacional para Reducir la Pobreza* (National Strategy to Reduce Poverty) and *Plan de Acción para el Desarrollo Humano, Infancia y Juventud:*

1992–2000 (Plan of Action for Human Development, Children, and Young People: 1992–2000). The former provides for the incorporation of the poor population into economic and social processes, while the second proposes the fundamental objective of giving special attention to particularly vulnerable groups such as children and young people.

The Government has assigned priority to programs for school nutrition, supplementary feeding for pregnant women, and improvement of housing, as well as to the "new life" program, aimed at improving conditions in poor urban areas. The Social Emergency Fund, created in 1990, is a government financing mechanism through which the Government can respond rapidly to social demands at the local, district, and regional levels by providing funding for projects in low-income communities.

Under a project to spur investment in the education and health sectors, urgently needed repair and maintenance work is being carried out in some 150 health and educational establishments. The existing administrative and technical difficulties are reflected in the fact that by the midpoint of 1992, only 15% of the social investment budget had been spent.

Health Policies and Strategies

Organization and Administration. The document *Política Nacional de Salud del Gobierno de Reconstrucción y Reconciliación Nacional* (Health Policy of the National Reconstruction and Reconciliation Government), prepared by the Ministry of Health in January 1990, establishes the general policies on health and emphasizes the objective, enshrined in the current national constitution, of attaining for all citizens "full health, with democracy, justice, and liberty." The document is in harmony with the regional declarations of strategic administration that promote the development of local health systems.

In 1972 an article was incorporated into the constitution establishing an integrated health services model in which the Ministry of Health and the Social Security Fund participated. That model was in operation until 1991 in eight of the nine provinces (the province of Panamá was excluded). In October 1991 a coordinated health services model was adopted under an agreement between the Ministry of Health and the Social Security Fund, which called for functional coordination in the development and execution of joint programs and in collection of quotas and provision of services to beneficiaries.

Human Resources. Panama has no explicit policy on human resources. There is little coordination between the institutions that train health workers and those that employ them. Thus planning to ensure the availability of the appropriate types and quantities of human resources is difficult.

Spending and Financing. Administrative measures have been implemented with a view toward rationalizing spending and instituting charges for services the Ministry of Health provides to beneficiaries of the Social Security Fund and to persons with sufficient means to pay for care they receive in Ministry establishments. The Social Security Fund, in order to increase its revenues, has decided to raise the number of participants on its rolls, especially from among the self-employed, who are currently outside the system.

Physical Resources for Personal Health Care Services. Studies were being conducted in preparation for the construction of two hospitals, one in the San Miguelito section of Panama City and the other in Santiago de Veraguas.

In 1992 a document was drafted on the maintenance and engineering of physical resources that defined policies and strategies and described the program and activities in this area. The document also noted the need to decentralize maintenance services and to promote active participation by maintenance personnel in the processes of design and construction of infrastructure, as well as in staffing, hiring, training, and safety activities.

Food and Nutrition. In 1990 the Government decided to carry out activities aimed at fostering the overall economic development, strengthening the food and nutrition surveillance system, developing nutrition education programs, and increasing production. The National Food and Nutrition Program, created in 1992, represents an effort at interinstitutional coordination aimed at strengthening, expanding, and improving government interventions in the area of food and nutrition. The Program's activities are particularly geared toward nutritionally vulnerable groups such as children and pregnant and nursing women.

Drinking Water, Sanitation, and Other Environmental Problems. There is a conspicuous lack of policies and technical standards on water, air, and soil quality, although efforts have been made to bring about their adoption. Environmental planning is being aided by a growing trend toward the requirement of environ-

mental and health impact studies, although this instrument is not well understood by all participants, including private companies and the Government.

Complete information on the magnitude of the problem of environmental pollution is not available owing to the lack of suitable environmental monitoring systems. There are several public sector agencies concerned with monitoring and control of environmental quality—including the Department of Environmental Health within the Ministry of Health, the Department of Human Ecology within the National Institute of Renewable Natural Resources, the National Commission on the Environment, and the Institute of Hydraulic Resources and Electrification—but there is little communication among them. They interact mainly through the Interinstitutional Committee on Water, Sanitation, and the Environment.

The Government has adopted a policy of total or partial privatization of the institutions that provide basic sanitation services. The aspects of these services that are most often privatized are billing and collections, design and construction of systems, water production, and, in the case of urban sanitation services, the collection, transport, and disposal of solid wastes.

Drugs and Immunobiologicals. The Ministry of Health maintains a registry of drugs and biologicals that are approved for sale in the country. The use of generic drugs is being promoted, especially in institutional settings.

As a consequence of the decision by the Social Security Fund to stop supplying drugs to hospitals that care for patients who are not affiliated with the fund, the Ministry of Health is creating its own supply system. The Ministry has prepared and distributed a national formulary.

Research and Development of Health Technology. Panama has no explicit policy on the generation, introduction, modification, and use of appropriate technology in accordance with the country's needs. In the case of drugs, it is unlikely that the demand can be met with national production; hence, it will be necessary to continue to import products, while also providing incentives for national production.

With the exception of one specialized testing laboratory, no facilities exist, nor are sufficient resources available, for an ongoing program to monitor the physical, chemical, and biological quality of the drugs and foods consumed by the population.

A set of radiology protection regulations established in December 1992 regulates the use of sources and in-

struments that generate ionizing radiation, particularly those used in the fields of medicine, industry, agriculture, and research.

Priority Programs and Population Groups. In 1992 the Government allocated 42% of the resources in the Public Investment Budget to the social sectors, compared to 28% in the biennium 1990–1991. Special importance is assigned to the poor, women, children, workers, and the elderly, and activities in the area of maternal and child health have increased. Campaigns are being carried out for the control of AIDS and diarrheal diseases, including cholera.

In the area of health care for adults, the formation of support groups for patients who suffer from hypertension, diabetes, and other chronic diseases is being promoted. The national health policy adopted in 1990 identifies workers' health as a priority and stresses the need to control risk factors in the work environment and to give special attention to the prevention and control of occupational diseases.

Activities for the prevention of occupational diseases and accidents are just beginning. Workers are protected through the Social Security Fund against contingencies such as work-related accidents, for which treatment is provided and compensation is paid in accordance with the injury suffered. In 1990 the Fund paid out 12,494 subsidies for work-related accidents. Of these, 48.9% went to agricultural workers, 23.0% to industrial workers, 11.4% to service-sector workers, 11.0% to workers in commerce, and the rest to workers in other areas of activity. In 1988 the number of workers who were paid compensation was 12,016, and in 1989, 11,809.

In 1990 the Ministry of Health established the Smoking Prevention Program under the Department of Adult Health. The program is active in all 12 regions of the country. The Tuberculosis Control Program has been reactivated and its organization, strategies, and standards have been updated and adjusted.

Health Promotion. The programs on health of adults and chronic diseases of the Ministry of Health and the Social Security Fund have reoriented their activities toward health promotion.

Organization of Services

Personal Health Care Services

Infrastructure. Health services in Panama are provided by the Ministry of Health, the Social Security

Fund, and private nonprofit and for-profit institutions. Administratively, the country is divided into 11 health regions plus the San Blas region. Four of the regions are in the province of Panamá (Panamá Este, Panamá Oeste, Metropolitana, and San Miguelito); six of the regions correspond to the provinces of Darién, Colón, Coclé, Veraguas, Chiriquí, and Bocas del Toro; and the last health region, Azuero, comprises the provinces of Herrera and Los Santos.

In 1987 the Social Security Fund covered 63% of the total population. This proportion declined to 55.3% in 1988 and to 42.1% in 1989, and then rose to 48.2% in 1990 and to 48.7% in 1991.

The private subsector is composed of clinics and inpatient facilities owned by health professionals or investors. These facilities provide hospitalization, consultation, emergency, diagnostic, and therapeutic services to the general population on a fee-for-service basis and to beneficiaries of the Social Security Fund. Health professionals in private practice operate their own offices, laboratories, and pharmacies.

Almost all the provinces have at least two hospitals and corresponding networks of health centers, subcenters, and posts. In 1991 the country had 691 health establishments—18 private and 673 public. Of the latter, 629 were affiliated with the Ministry of Health: 5 national hospitals, 21 regional and provincial hospitals, 145 health centers (25 with beds), 114 subcenters, and 344 health posts. The Social Security Fund had 44 establishments, of which 2 were national hospitals, 10 were provincial hospitals, and 32 were polyclinics.

In 1991 the Statistics Department of the Ministry of Health reported that there were 6,758 hospital beds in the country, or 2.71 per 1,000 population. Of these, 5,894 (87.2%) belonged to the public sector and 864 (12.8%) to the private.

Of the 5,894 beds in the public sector, 4,026 (68.3%) were in Ministry of Health establishments and 1,868 (31.7%) were in institutions operated by the Social Security Fund; 4,557 (77.3%) were for acutely ill patients and 1,337 (22.7%) were for chronically ill patients. The latter number was broken down as follows: 900 beds at the Psychiatric Hospital, 380 in the psychiatric ward of the Azuero Hospital, 10 at the Palo Seco Leprosarium, and 47 at the Rehabilitation Hospital operated by the Social Security Fund.

Of the 2,736 acute-care beds in Ministry of Health establishments, 1,123 (41.0%) are in national hospitals, 651 (23.8%) are in regional hospitals, 687 (25.1%) are in urban hospitals, 95 (3.5%) are in rural hospitals, and the remaining 180 (6.6%) are in 25 health centers equipped to provide inpatient care. There are also 13 beds in health subcenters and 5 in health posts. Of the

1,821 acute-care beds in Social Security Fund institutions, 844 (46.4%) are in the Metropolitan Hospital Complex, 155 (8.5%) are in regional hospitals, 787 (43.2%) are in urban hospitals, and 35 (1.9%) are in rural hospitals.

The national hospitals are located in Panama City and serve the population of the capital, in addition to functioning as national referral centers. The Ministry of Health operates the Santo Tomás Hospital, the National Oncology Institute, the Psychiatric Hospital, the Children's Hospital, and the Palo Seco Leprosarium. The Dr. Arnulfo Arias Madrid Metropolitan Hospital Complex is a Social Security Fund institution.

The regional hospitals are equipped to provide care in the basic specialties and some subspecialties. They are located in the most populous cities of the provinces and serve as referral centers for local hospitals and health centers. The urban hospitals are located in the principal towns of districts and provide basic medical, obstetric, pediatric, and surgical services. The rural hospitals (six operated by the Ministry of Health and two by the Social Security Fund) are in small towns and provide general inpatient and outpatient care.

The health centers are staffed by full-time physicians and dentists. Some centers are equipped with beds for observation of patients and for delivery care. The health subcenters and posts are staffed by nursing auxiliaries and health workers, respectively, and provide primary health care in small communities. In the San Blas region some of them have observation and delivery beds.

Hospital Discharges. In 1992 hospital discharges totaled 219,317 (9.3% of the population). Of that number, 216,022 involved acutely ill patients—191,825 (88.8%) treated in the public sector and 24,197 (11.2%) in the private sector. Of the discharges from public sector hospitals, 131,035 (68.3%) were from Ministry of Health establishments and 60,790 (31.7%) were from Social Security Fund establishments. The chronic-care facilities recorded 3,295 discharges: 3,246 from Ministry establishments and 49 from those of the Social Security Fund.

In 1991 the occupancy rate in acute-care hospitals was 60.2% (60.6% for Ministry of Health establishments, 68.4% for those of the Social Security Fund, and 41.7% for those of the private sector). The average hospital stay among acute patients was 5.5 days in public sector establishments and 5.4 days in private establishments. The average stay was 125.4 days in psychiatric care facilities and 127 days in rehabilitation facilities.

Outpatient Services. In 1990, 5,869,656 outpatient consultations were provided by 289 public sector health care establishments; no information was received from 64 health subcenters and 315 health posts. Ministry of Health establishments received 2,643,815 (45.1%) of those outpatient visits: 17.6% to hospitals, 26.5% to health centers, 0.88% to subcenters, and 0.13% to health posts. The Social Security Fund establishments received 3,225,841 (54.9%): 15.1% to hospitals and 39.8% to polyclinics. The number of outpatient visits per person was 2.5.

Of the persons receiving outpatient care at Ministry establishments, 37.3% were affiliates and beneficiaries of the Social Security Fund. In contrast, 90.3% of those receiving care at Social Security Fund establishments were affiliates.

Prenatal, Delivery, and Postdelivery Care. During the period 1987–1991, between 84% and 89% of all registered births were attended by a health professional. Postdelivery coverage increased from 44.9% to 50.9% between 1987 and 1991. In 1990 the figure was 59.8%.

Growth and Development Monitoring. The coverage of the program conducted by the Ministry of Health and the Social Security Fund for children under 1 year of age rose from 78% to 86% during the period 1987–1991, and the average number of visits per child increased from 2.27 to 4.43. For children aged 1–4, coverage decreased from 21.2% in 1987 to 11.2% in 1988, then increased slightly to 13.2% in 1989. It rebounded to 22.6% in 1990 and stood at 21.4% in 1991. The average number of visits per child has remained at around 2.5.

Immunization. In 1990 vaccination coverage among children under 1 year was 95% for measles vaccine, 93% for BCG, and 85% for both DPT and OPV. In 1991 overall coverage was 79.7% for measles vaccine (with the level ranging from 57.2% to 100% in different areas of the country), 86.9% for BCG (ranging from 66.1% to 138.7%), 81.7% for DPT (ranging from 62.7% to 99.3%), and 81.9% for OPV (ranging from 63.1% to 98.9%). In 1992 coverage was 76% for measles vaccine, 83% for BCG, 76% for DPT, and 77% for OPV.

An analysis of the changes in coverage by district between 1991 and 1992 suggests that the observed reduction in overall coverage was produced in districts that previously had coverage levels of over 80%, since in 1992 only five districts had coverage levels of under 50%—fewer than in 1991.

Family Planning. The statistics of the Ministry of Health indicate that the family planning program cov-

ers 6% of women of childbearing age, with an average of 3 visits per woman per year. In 1991, 41,290 new users were served. They made a total of 131,157 visits, or an average of 3.18 visits per woman. Coverage of women of childbearing age was 6.5%. The figures on consultations refer only to new users; no information is available on continuing users.

Food Aid Programs. Food aid is provided through institutional projects and programs, among them the program for agricultural production and community development, sponsored by the Committee on Food Aid Policies and Programs.

Since 1992 the Social Emergency Fund has been carrying out a school feeding program with funds from its own budget and from the Ministry of Education. The program benefits 42,137 children in 500 schools located in 11 districts in which malnutrition is highly prevalent. In 1992 the Ministry of Education provided lunches and snacks to 106,113 schoolchildren in 19 districts and 7 jurisdictions within the district of Panamá.

The Ministry of Health carries out supplementary feeding programs. For example, 8% of the Ministry budget is allocated to the maternal and child feeding program, which serves 100 pregnant women and 100 pre-school-aged children in each of the 180 health centers.

The participation of nongovernmental organizations in this area has been limited. There are a few programs (*Fundación Pro Niños* in Darién, *Nutrehogar*, *Patronato del Servicio Nacional de Nutrición*), but their coverage is low and they are aimed mainly at assisting children who suffer from severe malnutrition or at bolstering the school feeding programs.

Psychiatric Care. The information available for 1991 indicates that health establishments, excluding the Metropolitan Hospital Complex and the polyclinics in the metropolitan area, provided 41,718 psychiatric consultations, which represented 1.2% of all visits. The leading cause for these consultations was neurotic disorders, followed by schizophrenic psychoses, and unclassified syndromes or symptoms.

Other Specific Activities. The salt iodization program gradually waned and became virtually inactive during the period 1987–1989, but was reactivated in 1990. In 1993, as an emergency measure, Lugol's solution was administered to schoolchildren in the area endemic for goiter, and personnel were trained in clinical detection.

With a view to combating zoonoses, the Ministry of Health and the Ministry of Agriculture have intensified their joint activities for monitoring and control of bovine tuberculosis, equine encephalitis, and brucellosis. Methodologies were being developed to demonstrate the absence of disease (beginning with bovine tuberculosis), in order to replace the traditional methods of quantifying its presence.

Environmental Services

Infrastructure. During the past 20 years the Ministry of Health and the National Water Supply and Sewerage Institute have been responsible for the construction of water supply and sanitation systems. Since 1990 other State agencies have also played an important role in financing and executing water and sanitation projects, in particular the Social Emergency Fund, which has served as the executing agency for several such projects.

There is a trend toward private contracting for the construction of systems and reliance on nongovernmental organizations for the administration of financial resources. In recent years, more than 60 nonprofit organizations have been created. Owing to difficulties with international financing institutions, programs for the extension of water supply and sanitation coverage have been executed with national funds and have only succeeded in keeping pace with the demand created by natural population growth.

The National Water Supply and Sewerage Institute was in the process of administrative restructuring.

Solid Waste Disposal. The creation of the Metropolitan Sanitation Department (DIMA) in 1985, coupled with the construction of the Cerro Patacón sanitary landfill to supplement the existing landfills, solved part of the problem of solid waste disposal in Panama City and Colón. DIMA is responsible for almost all refuse collection, although the Canal Commission, the *municipio* of Panamá, municipal and state street-cleaning services, and specialized private companies also play a role. Collection of between 20% and 30% of solid waste is often delayed for several days. The Cerro Patacón landfill works quite efficiently, but it needs to be expanded.

Environmental Pollution. The population is being affected by the growing problem of environmental contamination. Environmental protection is the responsibility of the Ministry of Health. However, owing

to the lack of appropriate technical instruments and established criteria and quality standards, it is unable to respond satisfactorily to the myriad problems.

Health Promotion

The Department of Health Education within the Ministry of Health is currently being restructured. Health educators employed by the Ministry of Health and more than 199 assistants work at the regional level. They all are responsible for disseminating information about vaccination, environmental sanitation, and food and nutrition, and for supporting campaigns against cholera, malaria, and dengue.

Health Research and Technology

Neither the Government nor the health sector has any explicit plan or policy on health research. Only two institutions conduct health research: the Human Reproduction Institute and the Gorgas Memorial Laboratory. The research activities of the latter have diminished.

Community Participation

Through community participation it has been possible to construct more than 1,000 individual water supply systems and to expand latrine construction programs. Decree 401, promulgated in 1971, formalized the establishment of health committees as legal entities. In 1970, 184 health committees had been formed. By 1980 the number had risen to 1,580 and by 1990 to 1,800. The Ministry of Health is committed to enhancing the performance of these health committees and to that end established a set of rules of procedure.

Available Resources

Human Resources

As of March 1991 the country's health institutions had 2,831 physicians (11.5 per 10,000 population), 2,458 nurses (10.0), and 531 dentists (2.2). The ratio of physicians per 10,000 population ranges from 17.1 in the province of Panamá to 1.8 in the San Blas region; the other provinces show ratios of between 8.4 and 4.1. For nurses, the ratio ranges from 14.3 in the province of

Panamá to 4.1 in the San Blas region and is between 8.1 and 4.5 in the other provinces. The ratio of dentists ranges from a high of 2.9 in the province of Panamá to 0.8 in Bocas del Toro, and from 2.1 to 1.1 in the other provinces. In 1992 there were 22,600 health workers in the public sector: 11,150 employed by the Ministry of Health and 11,450 employed by the Social Security Fund. In 1993 the country had 4,131 physicians and 2,630 nurses, for a ratio of 16.5 physicians and 10.52 nurses per 10,000 population.

The University of Panama has four schools in the health sciences—medicine, medical technology, pharmacy, and nursing—which graduate an average of 50 physicians, 40 health technicians, 20 pharmacists, and 90 nurses per year. Since 1989, the School of Public Health, which awards a master's degree in public health, has graduated an average of 20 professionals per year. The Ministry of Health encourages the inclusion of public health topics in in-service training programs for health personnel and promotes the development of basic courses in public health for the heads of health services at the regional and local levels. There is a notable lack of personnel with training in the area of sanitation within the specialized institutions of the health sector.

Financial Resources

The public sector is financed basically by the Ministry of Health and the Social Security Fund. Accordingly, the principal sources of funding for the public health system are the regular revenues of the central Government, the contributions of employers and employees to the Social Security Fund, extrabudgetary funds obtained through loans, and donations from public and private international organizations. The income generated by fees for health services provided to the community (Hospital Administration Fund) represents another important source of funding.

The budget of the Ministry of Health was US\$ 85.9 million in 1986, US\$ 100.4 million in 1987, US\$ 93.2 million in both 1988 and 1989, US\$ 105.0 million in 1990, US\$ 122.3 million in 1991, and US\$ 145.2 million in 1992. Thus, the budget grew 69% between 1986 and 1992.

Precise information on the budget for medical services of the Social Security Fund is not available, but it is estimated that operating expenses in 1992 were close to US\$ 200 million. Adding this amount to the Ministry of Health budget brings the total institutional budget to US\$ 345.2 million, or approximately US\$ 138 per

person. The total health budget represents 5.7% of the GDP, in current dollars.

In 1992 the Ministry of Health allocated 86.6% of its budget to operating expenses and the remaining 13.4% to investment. Of the approved operating budget, 63.5% was spent on personal services, 4.07% on other services, 17.84% on materials and supplies, 12% on machinery and equipment, and the remaining 2.9% on transfers (this item includes the amount the Government pays to the Social Security Fund for coverage for public employees).

The total amount spent on health is unknown because no figures are available on spending in the private sector or on direct spending by individuals for the purchase of drugs and other items. During the period 1987–1992 execution of the approved budget of the Ministry of Health decreased from 90.83% in 1987 to 76.3% in 1988 and 76.5% in 1989, then rose to 80.9% in 1990, 85.6% in 1991, and 87.1% in 1992. Execution of the operating budget fluctuated, going from 96.6% in 1987 to 85.39% in 1989 to 89.6% in 1992. Among the components of this budget, materials and equipment showed the lowest execution levels (56.2% in 1988 and 59.3% in 1989), and under this component the level was extremely low in the case of machinery and equipment (6.5% in 1988 and 0.00% in 1989). Very low exe-

cution levels were also the case for the investment budget: 34.1% in 1988, 1.85% in 1989, 21.3% in 1990, 52.47% in 1991, and 75.45% in 1992. No data are available on the execution of the Social Security Fund budget.

Physical Resources, Equipment, and Supplies

Panama has 17 blood banks located throughout the country, with the exception of the province of Darién and the San Blas region. According to a report prepared in January 1989, there were 93 radiology units, which were located primarily in the Panama City Metropolitan Area (25), Chiriquí (17), and Azuero (13). All of the integrated health systems and health regions have at least one such unit, and all the national and regional hospitals have laboratory services and blood banks.

A total of 5,648 drugs made by national and foreign laboratories have been registered for use in the country. It is estimated that institutional spending on drugs is approximately US\$ 48 million per year (US\$ 35 million by the Social Security Fund and US\$ 13 million by the Ministry), which equals US\$ 19.2 per inhabitant. The amount spent by private institutions and individuals is unknown. There are 575 pharmacies operating in the country, of which 59 are public and 516 are private.

PARAGUAY

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

Paraguay has a total area of 406,752 km² and a population density of 10.5 inhabitants per km². The country has two clearly differentiated regions: the western region, with an area of 246,925 km² and less than 1 inhabitant per km², and the eastern region, with an area of 159,827 km² and 28.8 inhabitants per km².

In the last 4 years (1989–1992) Paraguay has experienced a process of democratic liberalization distinguished in particular by the direct election of municipal governments and the drafting of a new national constitution. The legacy left by the previous government, which held power for 35 years, is a sizable social debt and an accentuation of inequities that find expression in lack of an agrarian policy, low salaries, steep unemployment, scarcity of housing, high educational drop-out rates, and unmet health needs among the most underprivileged segments of the society. In rural areas, 77.1% of the land is concentrated in the hands of 1% of the large landowners (those who own more than 5,000 ha), while 40% of the small landowners (those who own less than 5,000 ha) hold only 1%. In the metropolitan area of Asunción, 58% of workers earn less than the legal minimum wage. In 1989–1990 unemployment in the formal sector of the economy was 22.8% of the economically active population (EAP) of greater Asunción.

Of the total population of the country, around 40% falls below the line that defines critical poverty (family income of less than one minimum wage). In urban areas there is a cumulative housing deficit of 310,000 dwellings. The national primary school drop-out rate is 52%. It is estimated that only one of every three children who begin primary school will complete the sixth grade and that 40% of the population is functionally illiterate. Low educational level is just as important a risk factor for infant mortality as unattended child-birth, as evidenced by the fact that infant mortality is 22.4 per 1,000 live births among women with a sec-

ondary or higher education but 44.8 for mothers with no more than 2 years of schooling.

Economic Situation

The economic foundation of the country is agriculture, especially the production of cotton and soy for export. The agricultural sector directly generates 26.7% of the gross domestic product (GDP), while industry and construction account for 21.6% and the service sector for 51.7%. The period 1988–1992 was characterized by slower economic growth and higher inflation. The annual rate of GDP growth declined during the last 5 years: from 6.4% in 1988 it dropped to 5.8% in 1989, 3.1% in 1990, 2.5% in 1991, and 1.7% in 1992. Total spending on social services—education, health, social security, and housing—was 2.3% of the GDP in 1988, 2.8% in 1989, and 2.9% in 1990. The share allotted to the various sectors in 1990 was as follows: education, 1.1%; health, 0.4%; social security, 1.1%; and housing, 0.3%.

Inflation rose from 16.9% in 1988 to 28.5% in 1989 and 44.1% in 1990. Adjustment policies brought the rate down to 11.8% in 1991, but it went up again to 17.8% in 1992. These adjustment policies have placed severe restrictions on the growth of public spending, internal lending to the private sector, and wages. In recent years there has been a marked decline in the population's income, manifested not only in the drop in real wages and agricultural prices but also in the decrease in social spending—on education, health, and agrarian reform—which has led to a decline in the standard of living of a large segment of the population.

Population

The 1992 census found that the country had a total of 4,123,550 inhabitants, 49.8% of whom were male and 50.2% female. The population is young, with persons aged 0–17 making up 47.0% of the total. This group is concentrated in the Central, Alto Paraná, Itapúa, Caaguazú, and San Pedro departments and the Asunción metropolitan area. In 1992, 51.0% of the popula-

tion lived in urban areas, compared to 43.0% in 1982. This growth was due to rural-urban migration. The population distribution by sex and area of residence did not change between 1982 and 1992. Life expectancy at birth has improved, rising from an average of 63 years for both sexes in 1980 to 66 in 1991.

The crude death rate decreased from 6.9 per 1,000 population in 1980 to 5.2 in 1991. In 1990 the birth rate was 34 per 1,000 population.

Mortality

Underregistration is estimated at 50.6% for general mortality, 35.4% for infant mortality, and 56.3% for maternal mortality. This situation is the result of deficient certification of deaths and reflects the low level of medical care coverage in the country. In addition, a large proportion of deaths are attributed to "signs, symptoms, and ill-defined conditions" (12.2% in 1991). A total of 12,698 deaths were registered in 1991. The lower degree of underregistration for the group aged under 1 year is attributable in part to the fact that information is easily gathered on births that occur in health institutions.

Since 1988 the ranking of the three leading causes of death—diseases of the heart, cerebrovascular diseases, and malignant neoplasms—has remained unchanged. However, accidents moved from sixth place in 1988–1989 to fourth in 1990–1991. Pneumonia and influenza have been in fifth place since 1988. Diarrheal diseases moved from fourth place in 1988–1989 to sixth and seventh in 1990 and 1991.

In 1991 heart diseases ranked either first or second as a cause of death in all 15 health regions of the country, but there was greater variation between regions in the ranking of the other causes. Malignant neoplasms, for example, were the third leading cause of death for the country as a whole, but ranked second in the Central, Misiones, and Amambay departments and in Asunción, and fifth in the department of Alto Paraná. The greatest variation was in the ranking of accidents, which were the leading cause of death in the department of Canendiyú, the seventh cause in Concepción and Guairá, and intermediate in rank in the other regions.

In Asunción and environs, diarrheal diseases were a relatively insignificant cause of death, but in Alto Paraná they ranked in third place and caused the same number of deaths as cerebrovascular diseases. Pneumonia and influenza, the fifth leading cause for the country as a whole, ranked seventh or eighth in the most sparsely populated areas.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

In 1991 a total of 1,695 deaths of children under 1 were registered, 22.2% of which were due to communicable diseases—slightly less than the proportion attributed to this cause in 1988 (25.7%). Nevertheless, underregistration of births (59.4%) and of deaths of children under 1 (35.4%) makes it impossible to know whether the risk of dying from communicable diseases has truly diminished in this age group.

The infant mortality rate per 1,000 live births in 1989, 1990, and 1991 was 31.6, 30.4, and 24.0, respectively, with regional variations in 1990 of 49.0 in Alto Paraná, 48.2 in Amambay, and 38.3 in Asunción. Neonatal mortality in 1990 was 14.5 per 1,000 registered live births; in 1991 it decreased to 12.6. In 1990 and 1991, birth trauma ranked first among the causes of death in the under-1 age group, and infections of the newborn ranked second, followed by prematurity, pneumonia and influenza, diarrhea, tetanus, and other infectious and parasitic diseases. The estimated perinatal mortality rate according to a national health survey carried out in 1990 was 41 per 1,000 live births.

The leading causes of death among children aged 1–4 years in 1988–1989 and 1990–1991 were diarrhea and pneumonia, which ranked first and second, followed by the cause group accidents and violence, which moved up from fourth place to third. In the age group 5–14 years, the leading causes in the period 1988–1991 were accidents and violence, diarrhea, malignant neoplasms, pneumonia, nutritional deficiencies, measles, tetanus, parasitoses, tuberculosis, and rheumatic fever.

Adolescent and Adult Health

In 1988–1991 accidents and violence accounted for the greatest proportion of deaths in the group aged 15–44 years. Of the deaths from this cause, 58% were of persons aged 15–24 and 24% were of adults aged 25–44; 80.1% were males.

In the group aged 45–64 years, heart disease, cerebrovascular diseases, and accidents predominated among the leading causes of death in 1988–1991. Homicide, tuberculosis, diabetes, direct obstetric causes, pneumonia and influenza, and diarrhea

ranked fourth through ninth. Among women aged 45–64 there has been a substantial increase in the proportion of deaths caused by heart disease (from 37% of all deaths from defined causes in 1988 to more than 45% in 1991).

Health of the Elderly

There were no significant changes in mortality patterns among those aged 65 and older. In 1989 the rate in this age group was 3,880 per 100,000 population. The estimated rate for the 5-year period 1985–1989 was 6,113 per 100,000 population. The difference reflects the degree to which mortality is underregistered in Paraguay. The leading causes of death in this age group for the period 1988–1991 were cardiovascular diseases, malignant neoplasms, and cerebrovascular diseases.

Maternal Health

Maternal mortality has remained high and has changed little since 1988. It is estimated that underregistration of maternal deaths ranges from 50% to 75% and that the rate is approximately 30 per 10,000 live births. Hemorrhage of pregnancy and childbirth, toxemia of pregnancy and the puerperium, and complications of abortion, in that order, are the three leading causes of maternal death.

Diseases and Health Impairments

Although morbidity statistics suffer from considerable underreporting, it can be affirmed that communicable diseases continue to be an important cause of morbidity, particularly among infants and children. According to the national health survey conducted in 1990, 21.7% of the persons surveyed had been ill or had some kind of health problem in the 2 weeks prior to the date on which they were interviewed. Among adults, 45.6% of the women and 55.4% of the men had suffered from some infectious or parasitic disease; among children under 5, this figure was more than 80%.

Vector-borne Diseases

Paraguay has one area with high incidence of malaria. That area, which encompasses the depart-

ment of Alto Paraná and part of the department of Caaguazú and has a population of 357,653, accounted for 95.6% of the malaria cases in the country in 1992. The incidence was 0.7 per 1,000 population in 1988 (2,884 reported cases), 1.3 in 1989 (5,247 cases), 0.7 in 1990 (1,660 cases), 0.8 in 1991 (2,983 cases), and 0.3 in 1992 (1,232 cases). In the group aged 15 to 49 years, the incidence was 3.4 times higher among men, mainly because they are more liable to be exposed to the vector in occupational settings.

During 1988 the number of reported cases of dengue totaled 405, but there was considerable underreporting. Between December 1988 and February 1989, 40,376 cases were reported in the country. No cases have been reported since late 1989. Hemagglutination inhibition tests were conducted on 103 suspected cases in 1990 and on 62 in 1991; all were found to be negative.

There have been no reported cases of yellow fever for more than 40 years. The urban form was eliminated with the eradication of *Aedes aegypti*; however, the reinfestation that began in 1990 has brought renewed risk of transmission. Routine vaccination programs, in combination with deforestation, have prevented the occurrence of jungle yellow fever.

With regard to Chagas' disease, several surveys have indicated that the infestation rate of the vector *Triatoma infestans* is 14% in the eastern region and that serologic prevalence of *Trypanosoma cruzi* infection is 20.0%. Studies carried out in blood banks showed a seroprevalence among donors of between 2.8% and 11.5%. Transplacental transmission is on the order of 3.0% to 3.6%.

Reported cases of leishmaniasis totaled 127 in 1988, 117 in 1989, 190 in 1990, 905 in 1991, and 1,392 in 1992, with higher incidence in the departments of San Pedro, Canendiyú, and Alto Paraná. The occurrence of increased numbers of cases is associated with the settlement of new agricultural lands. In 1992, 60.8% of the reported cases occurred in persons aged 20 years or older and 65.2% in males.

Between 1988 and 1991 no cases of schistosomiasis were reported. In 1992 there were 11 cases imported from Brazil: 10 in Alto Paraná, where the Itaipú dam is located, and 1 in Paraguari.

Vaccine-preventable Diseases

These diseases have been declining, thanks to the work of the Expanded Program on Immunization (EPI). In the period 1988–1992 vaccination coverage at

effective dosages among children under 1 year was maintained at adequate levels. In 1992 coverage was 87.1% for polio vaccine, 85.5% for DPT, and 86.0% for measles vaccine. As a result of vaccination efforts, the transmission of poliomyelitis was halted, and no cases were reported between 1986 and 1992. The other vaccine-preventable diseases continue to be a public health problem.

The most recent epidemic of measles occurred in 1990, when 820 cases were reported. There were 921 cases in 1987, 480 in 1988, and 181 in 1989. Cases of whooping cough totaled 727 in 1988, 389 in 1989, and 93 in 1990. From 1988 to 1991 the rate of neonatal tetanus has remained fairly stable at around 1 per 1,000 live births, but underreporting of cases may be substantial. There were 37 reported cases in 1989, 38 in 1990, 38 in 1991, and 17 in 1992. Seven cases of diphtheria were reported in 1989; three in 1990, four in 1991, and six in 1992.

Cholera and Other Diarrheal Diseases

In 1988 a total of 32,018 cases of diarrheal disease were reported among children under 5 years—11,157 among children under 1 year and 20,861 among children aged 1–4 years. In 1992 there were 36,239 reported cases—17,111 in children under 1 and 19,128 in children 1–4. In 1992 record-keeping improved and the information began to include the type of health personnel providing care and the clinical characteristics of the patients (presence or absence and degree of dehydration). Notified cases increased in 1991 and 1992, both in terms of absolute numbers and rates, probably due to increased reporting as a result of campaigns to educate the public on the use of oral rehydration fluids and the implementation of surveillance measures in response to the threat of cholera. Cholera remains a grave threat because sanitation conditions are conducive to the introduction and spread of *Vibrio cholerae*. Nevertheless, as of late 1993 just two isolated cases had been reported.

Tuberculosis

Tuberculosis continues to be a public health problem in Paraguay. The incidence of the disease has been high in recent years, especially among the indigenous and rural populations. Persons aged 15 and older are most often affected. In 1992 the rate was 30.0 per 100,000 population in the age group 15–19 years, 41.1 in the age group 20–49, and 126.3 among those aged 50

and older, with a total of 1,927 cases reported for all age groups. Reporting, particularly of bacteriologically confirmed cases, continues to be partial and irregular, and the number of cases reported does not reflect the true magnitude of the problem. In 1988 there were 1,488 reported cases, for a rate of 41 per 100,000 population; in 1989 the number of reported cases totaled 2,270, for a rate of 54.6 per 100,000; and in 1990 the total was 2,167, for a rate of 50.6 per 100,000.

Leprosy

Between 1988 and 1992 the number of new cases reported remained relatively constant. In 1992 a total of 405 cases were reported, 94.0% of which occurred in persons aged 15 years and over. The national prevalence rate is 2.8 per 10,000 population; however, there are reporting problems and therefore the true prevalence is undoubtedly higher.

Acute Respiratory Infections

Acute respiratory infections are the leading reason for doctor visits and the third leading cause of death among children under 5 years old. The number of reported cases increased from 71,950 in 1988 to 159,909 in 1992. This increase may have been due to educational campaigns carried out to encourage the population to seek treatment for such infections.

Zoonoses

Canine rabies occurs in practically the entire country, but it is most frequent in Caaguazú, Central, La Cordillera, Itapúa, and Paraguarí departments. Vaccination campaigns have not been as successful as anticipated because coverage has been low. Present efforts are focused on covering the areas determined by district-level epidemiologic studies to be at highest risk. The epidemiologic information and surveillance system has improved considerably. Transmission by vampire bats is prevalent in some regions. Between 1989 and 1992, 209 cases of bovine rabies were confirmed in the laboratory. Some 800,000 doses of bovine rabies vaccine were administered in 1992. This vaccine was imported and tested locally by the National Animal Health Service.

Five foci of foot-and-mouth disease were identified in 1990 compared with 57 in 1991 and 43 in 1992. Cov-

erage for the oil-adjuvant vaccine in 1992 was 77.0% for the eastern region and 53.6% for the western region. Paraguay is a party to the Cuenca del Plata Agreement for the Eradication of Foot-and-Mouth Disease, and in April 1993 it signed a general technical cooperation agreement with PAHO/WHO for the control and eradication of this disease.

As a result of the control program for brucellosis and bovine tuberculosis currently under way, an area in the department of Caaguazú has been kept free of these two diseases. Detection and elimination of cattle that test positive, control of transport of animals, and epidemiologic surveillance form the basis of the program. A positive reaction to tuberculin is seen in 0.2% of cattle, 1.3% of herds, and 0.06% of carcasses in slaughterhouses. The country is self-sufficient in production of diagnostic antigens, but all brucellosis vaccine is imported.

Sexually Transmitted Diseases and AIDS

The number of reported syphilis cases varied only slightly between 1988 (763 cases) and 1990 (765 cases). In 1992 a total of 1,022 cases were reported, which would appear to indicate a rise beginning in 1991. Reported gonorrhea cases decreased between 1988 (276 cases) and 1992 (180 cases).

Between 1986 and 1992, 53 cases of AIDS were reported, and 70% of those affected died. The rate of reported HIV infections was 2.4 per 100,000 population in 1992. Of the HIV-positive persons who were infected by the sexual route, an estimated 42.0% had homosexual contact, 12.0% bisexual, and 12.0% heterosexual; another 10.0% of HIV-infected persons are intravenous drug users, 10.0% are hemophiliacs, and 15.0% are persons with unknown risk factors. The number of cases is rising, which points to the need to promptly implement effective preventive measures.

Nutritional Deficiencies and Diseases

Chronic malnutrition is most frequent among families with six or more children (26.0%) and among children aged 12–23 months (24.0%). The mothers of chronically malnourished children generally have no more than 2 years of formal education.

According to a national survey in 1988, the prevalence of endemic goiter among schoolchildren aged 6 to 16 years averaged 48.6% nationally, ranging from 30.8% in Amambay to 57.8% in Misiones. The National

Program for the Prevention and Control of Iodine Deficiency Disorders, under the Ministry of Public Health and Social Welfare, carries out personnel training activities, distributes capsules of iodized oil, and conducts public information campaigns. In 1991 and 1992 the National Office of Social Welfare carried out a nationwide campaign to distribute iodine to schoolchildren.

Cardiovascular Diseases

In 1991 a survey was conducted in the area of Asunción to determine the prevalence of risk factors for cardiovascular diseases. Out of 497 individuals aged 20–74 years included in the preliminary analysis, 8.2% were found to be diabetic; 5.0% were already aware of their disease and 3.2% were not. According to this survey, the highest rates of diabetes and glucose intolerance are found among persons aged 40–59. Of those surveyed, 44.4% of the women and 51.5% of the men were of normal weight. However, it is noteworthy that a much higher proportion of women than men were extremely obese (28.1% as compared with 16.8%).

In the population studied the figures found for high serum cholesterol and high triglycerides were indicative of moderate cardiovascular risk: between 7.5% and 9.8% of the study population for cholesterol and 13.3% for triglycerides. Almost one-fourth (23.9%) of the individuals suffered from hypertension, 85% of them women and 15% men.

Malignant Neoplasms

Reporting, certification, and recording of malignant neoplasms are deficient. For 1992 outpatient care records of the Ministry of Public Health and Social Welfare showed only 25 cases of stomach cancer, 19 of colon cancer, 26 of lung cancer, 84 of breast cancer, 202 of cervical cancer, and 132 cases of cancer at other sites. In 1989 there were 1,157 registered cancer deaths.

Accidents and Violence

Accidents and violence are a major cause of illness, hospitalization, and death. In 1988–1992 traffic accidents accounted for approximately 72.0% of all accidents, occupational accidents for 18.0% (excluding cases served by the Social Welfare Institute), and accidents in the home for 10.0%.

Behavioral Disorders

In 1991 a study of mental health and harmful habits was conducted among 825,149 persons aged 12–45 years. It found that 10.3% of the study population abused some sedative, hypnotic drug, or stimulant, and some 4.6% abused amphetamines. Smoking and alcohol consumption were quite common: 32.4% currently or formerly smoked and 79.5% had drunk alcoholic beverages. Of those interviewed, 13.5% smoked regularly, and 10.0% smoked more than 10 cigarettes a day. The prevalence of marijuana use was 1.4%, that of cocaine hydrochloride use was 0.3%, and that of pain-killer use for other than therapeutic reasons was 3.0%. Some 2.5% of the study population used inhalants and 6.6% used over-the-counter sedatives. The two most widely used substances were alcohol and analgesics. Overall, the prevalence of current substance use (not including alcohol) was 70.6%.

Oral Health

According to studies carried out in 1989, the most important oral health problem is dental caries, which affects 98% of schoolchildren and 100% of adults.

Risk Factors

Risks in the Physical Environment

The most significant problems are those associated with expansion of the land area devoted to agriculture, human settlements, and hydroelectric works. Massive deforestation reduced the forested land of the eastern region from 68,364 km² to 41,764 km² between 1945 and 1985, and by 1992 it was estimated that the forested area had decreased to only 35,000 km². Other problems have to do with the destruction of natural ecosystems, the reduction of fauna to the point that some species are threatened with extinction, the rapid decrease in stands of hardwood trees, the pollution of watercourses through both discharge of contaminants and runoff, the use of chemicals in agriculture and their presence in industrial effluent, and the destruction of the habitats of indigenous peoples, with the ensuing loss of their cultural identity.

Although air pollution is not a major problem, it is becoming worse in some cities, especially Asunción, as a consequence of the increase in the number of motor vehicles and growing industrialization. Solid waste is

disposed of in open-air dumps, which results in contamination of surface and underground waters.

The sanitary sewer system in Asunción discharges directly into the Paraguay River. The average volume of wastewater discharge is currently about 1.5 m³/sec, and it is expected to remain below 5.0 m³/sec until after the year 2000. The dilution factor for these discharges is approximately 1/2,000, which obviates the need for treatment plants. The same applies to other units that discharge into the Paraguay River. Nevertheless, as the population grows and industrialization increases, this watercourse could be severely affected.

Risks in the Work Environment

Responsibility for work-related health issues is shared by the Ministry of Public Health and Social Welfare, the Ministry of Justice and Labor, and the Social Welfare Institute, which coordinate activities in the area of occupational health, hygiene, and safety through the Council on Occupational Health and Safety. No reliable data are available on occupational diseases, but it is known that just 9.0% of the economically active population and 17% of the general population have social security coverage. There is a shortage of specialists in the area of occupational health, as well as a lack of technical and legal regulations in the chapters of the labor and health codes that pertain to working conditions and the working environment.

Housing, Urbanization, and Natural Disasters

Paraguay has a cumulative housing deficit of more than 310,000 dwellings and an annual demand of some 15,000 units. Since 1989 the population of land around urban centers has increased considerably, and by 1992 it was estimated that some 23,000 families were living in squatter settlements in the Asunción metropolitan area. Flooding of the Paraguay River periodically affects the population living along the river in the metropolitan area, diminishing the quality of life of some 10,000 families. An estimated 20% of the population in the Asunción metropolitan area—approximately 50,000 families—live in slum areas, squatter settlements, rundown tenements, or settlements to which they have been forcibly relocated. The National Council on Housing does not cover even 50% of the annual demand for housing, nor is it able to alleviate the cumulative deficit in basic services and community infrastructure for that housing.

Drinking water is supplied to 42.3% of the urban population, and 34.7% has sanitary sewerage service. These figures reveal the marked deficiency in the coverage of both types of service. The rural population also suffers from deficiencies in water supply, sanitation coverage, and other systems for final disposal of wastes, owing to lack of funds.

Contamination of Food

Reliable figures on outbreaks of foodborne disease are unavailable. Education of the public on hygienic food handling and storage is deficient. The municipal government of Asunción provides few services to the community in the area of food safety. There is under-registration of both domestic and imported products, which escape regular inspection. Existing legislation on the subject is ample, but the institutions involved lack the personnel and funds to enforce it.

The National Food Safety Commission, created in 1990, is an organ of intersectoral and interinstitutional coordination and cooperation that plans and carries out food safety activities at the national level.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Health Policies and Strategies

In 1990 the National Council on Health approved a national policy on health and social welfare, which basically seeks to address, in coordination with public- and private-sector institutions, the health needs of the population. It establishes as priorities maternal and child health and nutrition, control of vaccine-preventable diseases, control of communicable diseases and zoonoses, environmental sanitation, strengthening of health services, interinstitutional coordination, community participation in the health services system, and attention to marginalized segments of the population and indigenous communities.

As of the end of 1992, health conditions and the functioning of the health care system had shown only modest progress toward fulfillment of the objectives set forth in the plan. This suggests that appropriate implementation strategies are needed to help move the plan from the talking stage to the action stage. There is no explicit government policy on population, although the subject is addressed implicitly in various policies

on health, employment, sex education, and the incorporation of women into the work force. In keeping with the national priorities, maternal and child health and attention to marginalized segments of the population and to rural and indigenous settlements are objects of special attention. Between 1989 and 1992 considerable effort has been devoted to assisting the population affected by floods.

Among the principal strategies applied are community participation and social action, education and public information, primary health care, strategic planning, local programming and decentralization, institutional financing and development, and intersectoral action. The national constitution enacted in 1992, through which the national health system and the governing offices were created, officially adopted the strategy of decentralization endorsed by the Ministry of Public Health and Social Welfare in its health plan, as well as development of the process of decentralization of health services in order to provide comprehensive medical care to the population.

Human Resources

Emphasis has been placed on the training of personnel in the areas of hospital administration, statistics and epidemiology, public health, and maternal and child health care, in addition to the training of technical and auxiliary personnel. As a complement to these efforts, a process has been initiated to redistribute personnel and grant salary raises and other benefits based on performance and productivity. Nevertheless, deficiencies exist in the training strategy and in the planning of training activities, as well as in the monitoring of educational processes.

Spending and Financing

In 1992 the percentage share of the health sector in the national budget was 6.3%. Increased investment during the 1980s was not accompanied by corresponding increases in operating budgets, which resulted in the underutilization of facilities, since funding was allocated only for personnel. The reduction in spending on supplies and maintenance has led to shortages of drugs and to the rapid deterioration of buildings and equipment. Wages accounted for 87% of ordinary expenditures between 1982 and 1988, while pharmaceutical products accounted for only 2.4% and food for only 3.2%. This apportionment reflects the traditional

policy of not providing food or drugs free of charge, except in special cases. Capital expenditures declined from 28.0% of total spending in 1990 to 18.0% in 1991, reflecting the termination of works in progress and the implementation of a more realistic policy on programming of new construction. As a result of the policy of supplying drugs at no charge to children under 2 years old, spending on drugs increased from 2.4% of total operating expenses in 1989 to 9.1% in 1991.

Only children and pregnant women can obtain free health care; other consumers pay a proportion of the cost of the services they receive. Of the total resources for health, 20.0% come from the national budget, 25.0% from contributions of the Social Welfare Institute, and 55.0% from direct payment by the population for services provided.

Food and Nutrition

The National Food and Nutrition Program relies in large measure on external food aid, especially from the World Food Program. The country does not have any specific policy on nutrition.

Drinking Water and Sanitation

Planning in the area of drinking water supply and sanitation is the responsibility of the Technical Planning Secretariat within the Office of the President; however, this entity does not play a major role. The environmental situation has not improved in recent years. The National Health Plan includes an environmental health program, in which all the institutions concerned with environmental management, water supply, and sanitation participate. The principal components of this program are drinking water supply and excreta disposal; pollution control; improvement, monitoring, and control of water quality; and sanitary disposal of solid waste.

The Sanitation Works Corporation, an agency of the Ministry of the Interior, is responsible for providing drinking water, sewerage, and drainage services for communities with more than 4,000 inhabitants, while the National Environmental Sanitation Service (SENASA) provides services for communities with fewer than 4,000 inhabitants. The Ministry of Agriculture and Husbandry regulates the exploitation of water resources based on a hydrologic map. Once a year, testing is conducted to analyze the levels of heavy metals and pesticides, mainly in the Paraguay

River, which is the principal source of drinking water for Asunción. A laboratory has also been set up to detect contamination generated by alcohol producers.

Drugs and Immunobiological Products

The country depends on external suppliers for drugs and biologicals. The function of the national production laboratories is limited basically to packaging the imported products. The Ministry of Public Health and Social Welfare exercises control over prices, and in the future will also ensure quality control through laboratories in neighboring countries.

Research and Health Technology

There is no national plan for health research; rather, isolated research activities are carried out. For example, the National University of Asunción, through the Institute for Health Sciences Research, is participating in basic and applied biomedical research, with financial assistance from international organizations. No explicit policy has been formulated on diagnostic and therapeutic technology.

Health Promotion and Legislation

No major health promotion activities are currently under way, with the exception of programs for the prevention of cholera and smoking. With regard to health legislation, a recent development was the inclusion of a chapter on health in the new national constitution, based on a proposal drawn up by the National Council on Health.

Organization of Services

Personal Health Care Services

Infrastructure. Coordination of the activities of the sector is the function of the National Council on Health, which is composed of all the institutions in the sector and headed by the Health Ministry. The Council is legally responsible for coordinating and monitoring the plans, programs, and activities of both public and private health institutions.

Health care is provided by three subsectors. The public subsector comprises the Ministry of Public

Health and Social Welfare, the military health services, the police health services, the municipal health services, the Sanitation Works Corporation, and the teaching hospital of the National University of Asunción. The semipublic subsector is composed of the Social Welfare Institute (IPS), the Paraguayan Red Cross, and the hospital of the Catholic University of Our Lady of Asunción. The private subsector includes a variety of private health establishments—linked together in the Association of Private Hospitals, Sanatoriums, and Clinics—as well as drug production laboratories and pharmacies. This subsector has grown substantially in the last 10 years and currently covers 3.3% of the population.

The Ministry manages 35.0% of the country's hospital beds, the IPS 21.3%, and the National University of Asunción 20.0%. The rest belong to other public and private institutions. The institution with the broadest health care coverage is the Ministry.

The Ministry is legally obligated to provide health care to all members of the population not covered by other health sector institutions, especially the poorest and most vulnerable groups. Of this population, which makes up between 60.0% and 65.0% of the total population, some 40%, mainly in rural and periurban areas, lacks health care coverage. The military health services cover about 10.0%; the police health services cover less than 1.0%; the teaching hospital of the National University of Asunción serves approximately 5.0%; and the IPS covers 18.0% of the population for the risks associated with occupational accidents, other accidents, disability, and old age. Both the Ministry and the IPS systems are organized by region and include varying levels of complexity. The municipal health services are responsible for public health functions such as household refuse collection and sanitation of public places in the capital city and other urban centers.

The country is divided into 15 health regions, which in 1990 were strengthened through an infusion of financial resources and personnel, as well as through decentralization, which gave them greater autonomy and operating capacity. Health services operated by the Ministry are organized into four levels. The first, or primary, level provides primary care in isolated and scattered rural communities with fewer than 1,000 inhabitants. The resources of this level consist of health posts staffed by volunteer health workers, nursing auxiliaries, and midwives. The second, or basic, level provides care of moderate complexity to rural and periurban communities of between 1,000 and 20,000 inhabitants. This level is made up of health centers with 6–19 beds, staffed by physicians, dentists, bio-

chemists, pharmacists, nurses, obstetricians, health inspectors, and technical, administrative, and auxiliary personnel. The third, or basic-intermediate, level is responsible for meeting more complex care needs through general medical services and some specialized services. This level is composed of regional hospitals and health centers. The fourth, or specialized, level carries out comprehensive care activities in certain specialized fields and serves as the final referral level for the regionalized health services. The principal resources of this level are the National Hospital, the Cancer and Burn Hospital, the Juan Max Boetner Sanatorium, the First Aid Hospital, and the Central Laboratory and Institute of Tropical Medicine.

Coverage. According to the national health survey conducted in 1990, 62.85% of the people who felt they had some health problem had not consulted any health services provider.

In 1991 there was a total of 2,028,209 visits to institutions of the Ministry of Public Health and Social Welfare—71.0% of them to health centers and 29.0% to health posts (in 1985 the centers accounted for 80.0% of the visits and the posts for 20.0%).

In 1989, actual coverage for outpatient care was 16.0% of the total population; there were 53,092 hospital discharges and the overall hospital bed occupancy rate was 44.8%. It is estimated that 47.0% of the total population did not receive basic health care in 1992.

According to data from the Ministry, 76.5% of births in urban areas and 44.5% of those in rural areas were attended by physicians, but according to the 1990 national health survey, 33.3% of births were attended by lay midwives, 2.5% by family members, 1.7% by other untrained persons, 35.3% by physicians, and 27.3% by nurses or professional midwives. It is estimated that 34.6% of births in 1990 occurred at home and 9.0% occurred in the home of a midwife. Ministry data indicate an increase from 72.3% in 1985 to 80.5% in 1989 in the percentage of institutional births that took place in public sector establishments, which might be explained by the decline in the purchasing power of the population.

A large number of diagnostic imaging services operate without complying with existing safety standards and without a complete understanding of the risks and dangers that exposure to radiation poses to the personnel.

The country lacks integrated blood transfusion services, and the services that exist are not subject to adequate quality control. It could be said that, except in the capital city, no adequate means exist to prevent the

transmission of HIV, syphilis, hepatitis B, and Chagas' disease through blood or blood products.

An estimated 91.3% of pregnant women received prenatal care in the period 1986–1990, 59.2% from physicians and 32.1% from nurses; the remainder (8.7%) received no prenatal care.

There is a shortage of mental health professionals, especially in rural areas, as well as a dearth of graduate courses in psychiatry and clinical training in psychology. Because of the scarcity of mental health units and services in general hospitals and health centers, this area is one of the least developed. The number of persons receiving rehabilitation services through the National Institute for the Protection of Persons with Special Needs, an agency of the Ministry of Education and Worship, increased from 903 in 1987 to 1,183 in 1991.

Environmental Services

Funds for environmental protection activities come from the fees charged for water and sewerage services; the 5.0% tax on consumption of alcoholic and nonalcoholic beverages; the 2.0% tax on the difference between the sales price and the assessed value of real estate located in Asunción and the 0.1%–0.3% tax on the assessed value of real estate; and loans from commercial banks and international organizations. In 1988 the Central Bank of Paraguay extended a loan for US\$ 7.6 million to the Sanitation Works Corporation (CORPOSANA) to increase the coverage of drinking water services.

Unlike CORPOSANA, which also administers services, the National Environmental Sanitation Service (SENASA) only plans, sets standards, develops projects, and constructs water supply and excreta disposal systems, which are then administered by local sanitation boards.

Health Promotion

Owing to a lack of information and education, there continues to be a poor understanding of the value of health and ways to preserve it, as well as of measures to prevent disease and accidents. Very little use is made of the mass media, audiovisual aids, and printed material in efforts to educate the population about health. The health education programs that do exist do not cover the entire country because of lack of human and financial resources and because the health services

have placed little emphasis on health promotion activities.

Research on education and communication to promote health is very limited, and little articulation exists between the social sectors for the coordination or joint execution of programs. The Ministry carries out education and public information programs in support of the campaigns on AIDS, cholera, family health, child survival, prevention of drug abuse, nutrition, and adolescent health, but no evaluations have been conducted to determine the nationwide impact of these efforts.

Health Research and Technology

Scientific and technological activity is carried out in response to specific circumstances and is not guided by an explicit policy. Work in the area of health science and technology is hampered by a lack of funding, the existence of only a minimal institutional structure, a marked shortage of human resources, and limited production of technology and knowledge.

University instruction does little to stimulate scientific creativity, and the courses offered on research methodology are insufficient. There is no information system that consolidates scientific knowledge and establishes a process for the dissemination of research findings. Most of the health research that is conducted is mainly descriptive and cannot be considered scientific research in the true sense of the term.

Social and Community Participation

Social and community participation is promoted and coordinated by the Ministry of Public Health and Social Welfare and other government agencies through the human development program, which receives external funding. The actions of the Ministry are aimed at supporting sociocultural activities and grassroots organizations, families, and communities within the areas of family centers.

Health care and health promotion for indigenous peoples, rural inhabitants, and the elderly have high priority. The activities include the promotion of self-reliance among these groups with a view to bringing about changes of attitude with regard to events and circumstances and a reappraisal of the role of the social forces acting in their communities.

The Catholic church, through the organization *Pastoral Social*, is working to encourage participation in

health activities. It is supporting a comprehensive program for health promotion and disease prevention, within the framework of maternal and child health and child development, through a training process carried out at the various levels of the church.

Available Resources

Human Resources

A survey of human resources carried out in 1985 revealed that multiple job-holding was widespread (some 70% of physicians held more than one job). While professionals are abundant, there is a shortage of technicians and auxiliaries, particularly in the areas of radiology, anesthesia, and laboratory science, as well as in nursing; in the latter field, moreover, auxiliary personnel carry out functions for which they have not been adequately trained. The training of health personnel, particularly mid-level personnel, follows traditional scientific patterns.

The distribution of Ministry personnel in the various health regions in 1991–1992 was uneven, with larger numbers of professionals concentrated in the Canendiyú, Caaguazú, and Metropolitan regions. In almost all the regions, with the exception of Paraguari, Alto Paraná, and Canendiyú, auxiliary personnel are more numerous than professional, administrative, and technical personnel. The passive-type training model is employed.

Financial Resources

Financing for the public subsector of the health sector (at current prices) rose from US\$ 143,089,398 in 1991 to US\$ 212,765,597 in 1992. The Ministry's share of the national budget during the last 5 years (1988–1992) ranged from 4.0% to 6.3%. Overall balance in the budget has been maintained through restriction of public investment and social spending on education, health, and agrarian reform.

Tax revenues continued to be insufficient and only covered about 50% of the central government budget. Internal financing is regulated by special laws that provide for the procurement of funds from specific sources and, in the case of the social security system, through contributions by beneficiaries. External financing consists mainly of loans and grants.

Out of the total Ministry of Public Health and Social Welfare budget of US\$ 105,575,714 for 1992,

US\$ 34,931,901 (39.6%) was allocated to the central level and the Caazapá comprehensive rural development project; US\$ 19,310,345 to payment of the external debt of the health sector, purchase of vehicles, construction, payments to international organizations, specialized hospitals, telecommunications, and electricity; US\$ 27,503,794 (31.1%) to general medical care (health regions); US\$ 7,662,279 (11%) to specialized medical care (hospitals); US\$ 3,632,719 (4.1%) to SENASA; US\$ 5,813,608 (6.6%) to the National Malaria Eradication Service; and US\$ 6,721,067 (7.6%) to the National Medical Center.

The IPS is funded basically through contributions from employers, workers, and the State. In addition, it receives income from the return on investments of reserve funds, contributions to the special insurance scheme, contributions from pensioners and retirees, and proceeds from surcharges, fines, etc. Workers contribute 9.0% of their salary, employers 14.0%, and the State 1.5%. Those covered under the special insurance scheme—teachers in the public and private sectors, university professors, self-employed persons, and domestic workers—contribute 8.0%.

Physical Resources

Since the change in government in 1989, the national policy on borrowing has been extremely restrictive, especially for the social sectors. As a consequence, the health sector, in particular the Ministry of Public Health and Social Welfare, has been obliged to redefine investment priorities, postponing new construction in order to devote available resources to strengthening the operating capacity of the services. No mechanisms are in place for maintaining up-to-date information on the number and the complexity of establishments and how well-equipped they are. No sectoral plan exists to coordinate programs aimed at strengthening the installed capacity of various institutions; rather, each acts on its own. Both the Ministry and the IPS implemented plans more than 10 years ago for the expansion of their physical infrastructure; however, they are proceeding according to separate plans, with no coordination between the two, which has resulted in duplication of efforts in the major cities of the country.

In 1989 the installed physical capacity of the public and semipublic subsectors included 716 establishments, of which 18 were hospitals, 205 were health centers, and 493 were health posts or infirmaries. Of the 716 establishments, 479 were operated by the Min-

istry, 134 by the IPS, 76 by the military health services, 23 by the police health services, 2 by the National University, and 2 by the Catholic University.

The Ministry's establishments consist of 8 specialized hospitals, 15 regional health centers, 123 local health centers, and 333 health posts. The IPS maintains 1 central hospital, 32 health units, and 101 health posts. The military health services operate 1 central hospital, 4 divisional hospitals, 36 infirmaries, and 35 health units. The police health services include 1 central hospital and 22 infirmaries. The National University of Asunción maintains a teaching hospital and a neuropsychiatric hospital, and the Catholic University operates two hospitals, one in Asunción and the other in Villarrica.

There are blood banks and hemotherapy units operated by the Ministry in four health regions in the interior of the country, and in Asunción there is a national blood transfusion center as well as five peripheral centers (in the IPS, in the Paraguayan Red Cross, and in the teaching hospital). They perform blood typing, Coombs' test, ELISA (for HIV), testing for hepatitis and Chagas' disease, VDRL test, and transfusions.

The Ministry provides anatomopathological diagnostic services in seven locations in the Central department and Asunción. Anatomopathological diagnostic services are also available through the IPS, at the National University, and in private centers, all located in the capital city. The National University (Institute for Health Sciences Research) participates in the production of *Trypanosoma cruzi* antigens and antibodies.

Extrasectoral Resources

The Government has entered into multiple agreements with both bilateral and multilateral international organizations with a view toward expanding the coverage of health services and improving health care for the population. Aid has been received for efforts in the following areas: progressive development of the network of regional health services, extension of water supply and sanitation coverage in rural areas, institutional development and strengthening, maternal and child health care, food and nutrition, the leprosy control program, the blindness prevention program in the second health region, disease control, research on a method for detecting Chagas' disease, the national AIDS program, immunization, diarrheal disease control, basic sanitation, and the rural health program.

Funding has been obtained, *inter alia*, from the Inter-American Development Bank; the International Bank for Reconstruction and Development; the German Development Bank; the international cooperation agencies of Brazil, France, Germany, and Japan; UNICEF; the Pan American Health Organization and the World Health Organization; the Government of the United States of America; the United Nations Population Fund; the Kellogg Foundation; the World Food Program; the United Nations Development Program; the International Development Research Center (IDRC) of Canada; Rotary International; and the United States Peace Corps.

PERU

GENERAL HEALTH SITUATION AND TRENDS

In 1989, the Republic of Peru (whose territory extends for approximately 1,289,000 km²) was organized into 12 regions, a department (Lima), and a constitutional province (El Callao). The regions, in turn, were broken down into 186 provinces, which were divided into 1,787 districts. In 1993, however, the Democratic Constitutional Congress resolved to do away with this structure and return to the earlier division into departments with intendants appointed by the President of the Republic. This complicated situation in regard to the country's political and administrative structure has made it difficult for the State to handle its functions and has had a negative impact on health programs and the health services network, especially the decentralization process.

Health and Living Conditions

Peru underwent a severe economic and institutional crisis beginning in 1982 and ending in 1992. Between 1987 and 1992, national production fell 23.5%, per capita production dropped 28.9%, and poverty became far more acute and widespread. Real per capita production in 1992 was no better than it had been in 1960; in other words, in 30 years it had actually declined. Inflation reached a high of 7,650% in 1990, but it began to be brought under control in August of that year after the Government adopted several stabilization measures.

On 5 April 1992 the Executive Power dissolved the Legislature and Judiciary. A Democratic Constitutional Congress was elected at the end of that year, and its first session was convened in January 1993.

Living conditions have seriously deteriorated for most Peruvians, and the numbers living in extreme and critical poverty have increased exponentially. According to the 1991 Standard of Living Survey, 21.7% of the total population was living in extreme poverty (total per capita expenditure below the per capita cost of the basic food basket) and 53.7% was in a state of

critical poverty (total per capita expenditure below the basic shopping basket, including food and nonfood items).

According to the 1981 census, the illiteracy rate in the population 15 years of age and over stood at 18%, while estimates for 1991 indicate that in the interim the rate declined to 10.7%, although high percentages prevail in the departments of Apurímac (36.6%), Ayacucho (34.4%), and Huancavelica (30.2%). In urban areas the rates tend to be lower, but they remain high in rural areas, and are higher among females than males.

Since 1991, school enrollment has increased at a slower rate than the population itself. This situation is undoubtedly a reflection of the fact that employment has risen among poor adolescents over the age of 11. In other words, teenagers are dropping out of school and going to work to supplement the family income because of purchasing power lost to the economic crisis.

Since the end of January 1991, the country also has had to contend with major economic repercussions from the cholera epidemic. Exports of fish, fruit, and other horticultural products were severely affected and internal consumption of these products also was greatly reduced; heavy fines were levied because of quarantines in foreign ports; domestic productivity declined as a result of conditions in the economically active population (EAP); and enormous sums had to be spent on treatment and prevention. For 1991 alone, economic losses attributable to the cholera epidemic were estimated at US\$ 500 million.

Real per capita social expenditure fell from an equivalent of US\$ 49.50 in 1980 to US\$ 9.10 in 1991 (in 1985 dollars). In 1990, the Government's social expenditure for education, health, housing, and employment came to only 28% of 1980 levels. Social expenditure as a percentage of gross domestic product (GDP) also saw a significant decline: the expenditure on health went from 1.2% at the beginning of the 1980s to 0.5% in 1990.

Population

In 1992, Peru's population was estimated at 22,453,000. It is a relatively young population: approx-

TABLE 1
Selected demographic and health indicators,
by region, Peru, 1992.

| Indicator | Region | | | | |
|---|--------|-------|-----------|--------|------------------------|
| | Peru | Coast | Highlands | Jungle | Lima metropolitan area |
| Population growth (%) | 2.0 | 2.2 | 1.3 | 2.4 | 2.5 |
| General mortality per 1,000 population | 7.6 | 7.3 | 11.0 | 7.5 | 5.0 |
| General underregistration of deaths (%) | 47.3 | 50.6 | 49.3 | 51.4 | 37.4 |
| Infant mortality per 1,000 live births | 76.1 | 71.6 | 99.2 | 76.6 | 51.8 |
| Percentage of total population | 100.0 | 30.1 | 29.1 | 7.8 | 33.0 |
| Birth rate per 1,000 population | 29.0 | 29.5 | 33.6 | 34.6 | 23.1 |

Source: National Population Council, Peru, 1992.

imately 48% of its inhabitants were under 20 years of age, whereas only 3.9% were 65 years old and older. Life expectancy at birth was estimated at 64 years—66 for women and 62 for men. General mortality was 7.6 per 1,000 population, with extremes ranging from an estimated 14.1 in the department of Huancavelica to 5.0 in the Lima metropolitan area.

The birth rate ranged from 23.1 per 1,000 population in the Lima metropolitan area to 36.5 in the department of Huancavelica, with a national average of 29.1 per 1,000 and an overall fertility rate of 3.5 children per woman. Population growth at the onset of the 1990s was 2.08% a year, with marked differences between regions. In fact, all the demographic indicators mentioned have been on the decline. Overall fertility in 1989–1991 was 3.5 children per woman, having decreased 15% in the last 5 years. Women in rural areas and those with no schooling had the highest overall fertility rates: 6.2 and 7.1, respectively—figures not akin to those reported for the Peruvian population in 1940.

Rural-urban migration has led to a mushrooming of human settlements on the outskirts of the large cities and consequent shifts in the population's geographic distribution. It is estimated that the proportion of rural population nationwide is 30%. According to estimates based on the 1981 national census, the Lima metropolitan area has 6.4 million inhabitants—nearly 30% of the national population. The latest census was conducted on 11 July 1993.

The Peruvian territory is broadly divided into three natural regions: the coast, the highlands, and the jungle. The Lima metropolitan area, even though it is located on the coast, may be viewed as a separate region because of its special characteristics, such as its high population density and concentration of all types of resources.

The four above-mentioned regions vary greatly in terms of geography, population, degree of development, and health conditions. More than 63% of the national inhabitants reside in the Lima metropolitan area and the coastal region, and most of them live in the large cities. In the highlands, on the other hand, much of the population tends to be scattered in rural areas and small settlements, and access to health services often is difficult. The jungle region, which corresponds to 50% of the national territory, has less than 8% of the population, most of it urban, with a widely dispersed rural population. Table 1 gives some demographic and health indicators for the respective regions.

Mortality

At the beginning of the 1990s underregistration of births was estimated at 40%, and that of deaths at almost 50%. Only two-thirds of all registered deaths were medically certified. As a result of these two circumstances, only 35% of all the deaths in the country had a medically certified defined cause. The proportion of deaths certified by a physician ranged from 22.2% in the highlands (with a low of 11.5% in the department of Apurímac) to 60% in the Lima metropolitan area.

The latest statistics on mortality that give a clear picture of the country's health situation are from 1989. The five leading groups of causes of death registered in that year were acute respiratory infections (representing 15.3% of general mortality), malignant neoplasms (10.7%), violence or external causes (10.4%), acute diarrheal diseases (6.7%), and diseases of pulmonary circulation and "other" forms of heart disease (including heart failure) (5.4%). Tuberculosis ranked sixth, ac-

counting for 5.1% of all medically-certified registered deaths.

Analysis by age groups and regions shows marked variations in the leading causes of death. There is underregistration of deaths due to external causes, especially deaths associated with political violence (terrorism). External causes were the leading group in the population aged 5 to 49 for the country as a whole, representing about 28% of all deaths in this age bracket.

Mortality in the age group 1–4 years old was 8.9% of the national total, with variations ranging from 3.9% in the Lima metropolitan area to 10.7% in the highlands and 15.1% in the jungle region.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

The following data are from the 1991–1992 Demographic and Family Health Survey (ENDES 1991–1992), which involved interviews with 15,882 women of reproductive age who together had had 8,473 deliveries in the previous 5 years. Total estimated deliveries for the country as a whole during the same period amounted to 650,000 per year.

Perinatal and Child Health

Different infant mortality estimates for the 1990–1992 period put the figure at between 55 and 80 per 1,000 live births. In 1992, the National Population Council calculated an infant mortality rate for Peru of 76.1 per 1,000, with extremes ranging from 52 to 120 in the Lima metropolitan area and the department of Huancavelica, respectively.

According to ENDES 1991–1992, children under the age of 5 numbered about 3 million and represented 13% of the total population. Infant mortality for the 1987–1991 period was estimated at 55 per 1,000, and mortality in children under 5 at 78 per 1,000. Infant mortality was estimated to have fallen 25% in the 5-year period, from 73 per 1,000 in 1982–1986 to 55 per 1,000 in 1987–1991. The decline in children aged 1 to 5 was even greater. Thus, the probability of death in children under 5 years of age dropped from 106 to 78 per 1,000 during the period in question. This decline was part of a downward trend in mortality that began 20 years ago, as can be seen in estimates based on the history of births in three successive surveys—the 1977–1978 National Fertility Survey (ENAF), ENDES

1986, and ENDES 1991–1992—applying both direct and indirect methods.

Findings from the two ENDES surveys may be underestimated, however, because the information on infant deaths was provided by the mothers, and according to several studies they tend to underreport these figures. What is important, however, is the declining trend, which can be seen in all the studies. Especially notable was the reduction in infant mortality in the latter part of the first year of life, such as in deaths from acute diarrheal disease, diseases preventable by vaccination, and acute respiratory diseases, even though these all continue to be important causes of death.

The Lima and Arequipa areas have the lowest levels of infant mortality, with rates only slightly more than half as high as in the rest of the country. By contrast, in the highlands infant mortality reaches levels in excess of 100 per 1,000 live births. In general, infant mortality is lowest in the Lima metropolitan area and other urban areas, while high levels persist in rural areas.

In 1989 three broad groups of causes were responsible for 71.1% of all registered deaths in children under 1 year: certain conditions originating in the perinatal period (28.8%), acute respiratory infections (26.8%), and acute diarrheal diseases (15.5%). Ranking fourth among the basic causes of infant death was malnutrition, which is often associated with other causes as well.

Among the conditions originating in the perinatal period, hypoxia or asphyxia of the fetus or newborn, fetal immaturity, and neonatal tetanus were the leading causes. Of all the births, 54% took place outside health establishments and 47% were not attended by a professional; 65% of the mothers were not vaccinated against tetanus and 36% of them received no prenatal care whatsoever.

Of the deaths in children 1 to 4 years of age, 63.4% were attributed to three leading causes: acute respiratory infections (25.7%), acute diarrheal diseases (22.5%), and malnutrition (15.2%). This pattern was similar in all the country's regions. External causes (mainly accidents) were the fourth leading cause of death and represented 5% to 10% of the total.

Adolescent and Adult Health

Adolescents aged 10 to 19 made up 23% of the total population. Because of the economic situation, many in this age group have been obliged to go to work. Child and juvenile labor, which is characterized by

work in the informal sector and low skill levels, has become yet another health risk for this population.

Violence was the leading cause of death in this age group, especially among males. Other leading causes were acute respiratory infections, tuberculosis, and malignant neoplasms.

Adolescent fertility rates have declined in the last 20 years, more because of the fact that the first union is delayed than because the number of children has declined. Eleven percent of the female population between the ages of 15 and 19 were already mothers or were having their first pregnancy at the time of the survey; in rural areas the proportion was 25%, and among teenage girls with low levels of schooling it was 29%. Nevertheless, 29% of the adolescent females of reproductive age were using some form of contraception.

In the large cities, 20% of the hospital deliveries corresponded to adolescent women 10 to 19 years of age, and one in every five teenage mothers had had two to four pregnancies before reaching the age of 20. This group accounted for approximately 15% of the country's maternal mortality, as well as about 20% of all deaths from abortion.

There is little information available on the health of adults other than data on mortality. The situation is similar to that of adolescents, the leading causes of death being external causes, tuberculosis, and malignant neoplasms, with diseases of the circulatory system gaining in importance.

Health of Women

Almost half the female population (49%) is of reproductive age (15 to 49 years). According to data from ENDES 1991–1992, there has been a selective migratory flow of women of reproductive age toward the cities in recent years. This is the population group that migrates the most—an important fact for the organization of maternal and child health services.

In 1990, the three leading causes of registered deaths in women of reproductive age were tuberculosis; acute respiratory infections; and complications of pregnancy, delivery, and the puerperium. Another important cause of death was malignant neoplasms, with the principal sites being the stomach, cervix uteri (which represented more than 20% of all registered deaths from cancer in women), and breast (the second leading cause of death due to gynecological cancers).

Anemia is one of the leading nutritional problems in women. Data from various sources indicate that 7 out of every 10 pregnant women attended in Ministry of

Health establishments suffer from iron-deficiency nutritional anemia.

The diet of women in general and pregnant women in particular is deficient because of the population's low purchasing power, poor eating habits, and lack of knowledge about nutrition, with the result that the scarce money available for food in the household budget tends to be spent on "empty calories."

The total prevalence of contraceptive use was 36% in women of childbearing age and 59% in women who were married or living in a consensual union. This figure was lower in illiterate women (34.9%) and those living in rural areas (41.1%). Forty-five percent of the users said that they obtain the contraceptives directly from the private medical sector (clinics, private physicians, etc.) or buy them in drugstores. In Peru, the problem of family planning is not a matter of generating demand, but rather of improving the quality of services in order to deal with unmet demand.

Prenatal control is inadequate: 65% of pregnant women were not vaccinated against tetanus during their pregnancy, and this proportion reached 74% in rural areas and 79% among women with low levels of schooling. According to ENDES 1991–1992, 10% of all deliveries were by cesarean section.

Regarding morbidity in women of childbearing age, in 1985 the Ministry of Health establishments reported, based on discharge data, that the main causes of 196,559 hospitalizations were maternal morbidity (27%), diseases of the digestive system (6%), diseases of the genital organs (4%), tuberculosis (2%), benign tumors (2%), and diseases of the urinary tract (2%). The data on discharges indicate the following leading causes of maternal morbidity: hemorrhage of pregnancy and childbirth (38%), complications of the puerperium (13%), toxemia of pregnancy (13%), abortion (13%), dystocia labor (1%), and other causes (22%).

Maternal mortality is estimated at 30.3 per 10,000 live births. This figure was calculated on the basis of in-hospital maternal mortality, which in 1985 was 16.5 per 10,000 for the country as a whole. Five years later the Ministry of Health's Office of Statistics and Information reported a maternal mortality rate of 18.1 per 10,000 live births in the Ministry's establishments.

Available hospital data indicate that direct causes are responsible for 85% of all maternal deaths and indirect causes for 15%. Among the leading direct causes are hemorrhage (23%), abortion (22%), infection (18%), and pregnancy-induced hypertension (17%). The leading indirect cause of maternal mortality is tuberculosis.

Domestic violence and psychosocial disorders also are causes of morbidity, although they are not often re-

ported. In the Lima metropolitan area more than 80% of all the complaints filed for assault involved women 20 to 39 years of age.

Health of Special Groups

Armed violence, originally concentrated in the departments of Ayacucho and Huancavelica, has spread to the point that half the country's population is at risk. It was estimated in mid-1992 that at least 300,000 persons had been forced to leave their places of origin because of the armed conflict. Drug trafficking, compounded in some of the coca-producing areas with problems of subversion, has severely harmed institutions, families, and individuals, especially young people.

There is little official information available about the health situation of indigenous peoples. In the Peruvian portion of the Amazon basin, which takes up more than 50% of the national territory, there are 60 indigenous groups corresponding to 12 different language families. In 1992, these groups numbered 170,000 and represented 20% of Peru's rural Amazon population. In addition, there are mestizo peasants living along riverbanks in the low-lying jungle regions, autochthonous mestizo peasants in the upper jungle region, and settlers, most of them from the highlands.

Currently the Amazon ethnic groups are mostly sedentary, with very few living a nomadic life. It is estimated that there are 1,300 communities in the jungle region. As of 1989, only 609 of these communities were officially recognized and held title to their lands.

The health of jungle-dwelling population groups has deteriorated, and the problem is due in large part to colonization and penetration of the market economy. A sizable proportion of the Amazon population has no access to health services.

Information on the disabled population is incomplete. Research conducted in 1993 by the National Rehabilitation Institute and the Peruvian Society of Physical Medicine and Rehabilitation found that the prevalence of some sort of physical impairment was 45.4%; disabilities, 31.3%; and handicaps, 13.1%. The study surveyed some 3,000 persons nationwide, selected as a representative sample of the country's 22.5 million inhabitants. The responses indicate that institutional rehabilitation is insufficient and coverage is low. Based on positive experiences with community-based rehabilitation in Iquitos (jungle region); Cajamarca and Puno (highland region); and Chimbote, Ica, and Lima (coastal region), arrangements are being

made to provide comprehensive treatment in the health development areas (ZONADIS) with technical support from the Ministry of Health's National Rehabilitation Institute.

Diseases and Health Impairments

Vector-borne Diseases

A total of 35,442 malaria cases were reported for the country as a whole in 1989, 30,814 in 1990, 40,086 in 1991, and about 55,000 (246 per 100,000 population) in 1992. In addition to the rising number of cases, the proportion due to *Plasmodium falciparum* has increased every year since 1990: 0.1% in 1989, 0.4% in 1990, 0.8% in 1991, and 1.6% in 1992. As of August 1993, a total of 2,099 cases of *P. falciparum* malaria had been reported, representing approximately 8% of all cases.

Of the country's malarious areas, the highest incidence is in the inter-Andean valleys, where in 1991 the annual parasite index (API) was 12.7 per 1,000 population. In these valleys, the difference in incidence between the under-1-year-old age group and the population aged 15 and older yielded a relative risk of 0.81. In other words, the risk of contracting malaria is nearly the same inside the home as it is outside. This could be because the insecticides being used are ineffective, or possibly because the over-15 population has developed some degree of immunity.

Since 1990, there have been dengue epidemics associated with dengue virus serotype 1 in several cities of the Amazon area, and the risk of new outbreaks, including dengue hemorrhagic fever, the more severe form of the disease, continues, especially in the jungle region, where vector household infestation indices are as high as 15%. It is estimated that 80% of the Amazon area's inhabitants (about 1 million persons) have had contact with dengue virus serotype 1.

There were outbreaks of jungle yellow fever in various parts of the country during the 1986–1989 period. The number of reported cases fell from 17 in 1990 to only 8 in 1991, thanks to intensified vaccination efforts in rural areas. Nevertheless, there is danger that the disease may become urbanized, especially in the departments of Piura, San Martín, Huánuco, Ayacucho, Madre de Dios, and Puno, where *Aedes aegypti* infestation rates are high.

Leishmaniasis is a threat in 74% of the national territory. More than 10,000 cases were on the register in 1992. The clinical forms diagnosed in Peru were Andean cutaneous leishmaniasis (uta) and mucocuta-

neous leishmaniasis (espundia). The visceral form has not been reported.

Plague has been endemic in the northern departments of Piura and Cajamarca since 1903. It is cyclic, with small outbreaks of about 20 cases every 3 or 4 years, and the case fatality rate is approximately 10%. At the end of 1992 an unusually large outbreak began, which as of May 1994 had caused 1,150 cases and 54 deaths. In addition to the departments mentioned above, Lambayeque and La Libertad departments were also affected. This disease's behavior pattern is attributed to, among other factors, the El Niño current, which brings an abundance of rainfall every 3 or 4 years that, in turn, results in an increase in the rodent population. Another factor is the migration of the rural population, particularly in the areas of political conflict, since renewal of agricultural practices and storage of grains in dwellings favor the proliferation of rodents.

Information about Chagas' disease is limited to entomological data: there are at least 19 species of triatomine bugs, with a heavy predominance of *Triatoma infestans* in the southern part of the coastal region and the inter-Andean valleys of Apurímac and Ayacucho. Second in importance is *Panstrongylus herreri*, which is found in the Amazon area and along the northern coast. Both vectors have been found to be infected with *Trypanosoma cruzi*.

Bartonellosis is endemic in the inter-Andean valleys of Lima, Ancash, Cajamarca (along the Ecuadorian border), and Ayacucho. There was an epidemic in 1992, with more than 6,000 reported cases.

Vaccine-preventable Diseases

Thanks to increased vaccination coverage, at the beginning of the 1990s the incidence of diseases preventable by vaccination declined. There were, however, some outbreaks, such as more than 22,000 cases of measles, 6 cases of diphtheria, 364 of whooping cough, 128 of wound-related tetanus, and 118 of neonatal tetanus in 1992. The last case of poliomyelitis confirmed by virus isolation was reported in August 1991, and intensive efforts continue to be carried out in terms of both vaccination and epidemiologic surveillance.

Cholera

The most striking feature in Peru's epidemiologic profile has been its cholera epidemic, the first cases of

which appeared in the country at the end of January 1991. In 1991 and 1992, the cumulative total of reported cases exceeded 540,000, with approximately 200,000 hospitalizations and 3,620 deaths. The pattern of weekly incidence in 1992 and 1993 paralleled that of 1991, with the number of cases peaking in the first 3 months of the year and then falling off sharply after April.

The incidence and hospitalization rates in 1992 were only 65% as high as in 1991, and mortality was only 25% of what it was in 1991. The low case fatality rate of 1.0% in 1991 was reduced even further, and the average for the country as a whole in 1992 was only 0.3%. This low level of case fatality is attributable to early recognition of the disease, intensive public information campaigns, and the high concentration of cases in urban areas. Moreover, the diagnostic criterion (case of acute diarrhea compatible with cholera) made it possible to identify less serious cases and to keep underregistration at low levels, which undoubtedly contributed to the low case fatality ratio. The case fatality ranged from 0.1% in the Lima metropolitan area to more than 4% in some of the highland provinces.

As of mid-1993, the incidence of cholera was down to 50% of what it had been as of the same date the previous year. The departments with the highest incidence in 1991 were in the jungle region (Ucayali and Loreto, which have about 4% of the population), and those least affected were in the southern highlands (Cuzco and Apurímac, with 0.1% each). In 1992, on the other hand, the highest rates were in the coastal region—Arequipa (2.4%), Lima-El Callao (1.7%), and La Libertad (1.0%)—and the lowest were in the southern part of the country—Madre de Dios in the jungle region (only one case in 1992) and, in the highlands, Puno (with an incidence of 0.02%) and Apurímac (0.1%). As of May 1993 the situation was similar to that of 1992 in terms of both case-fatality and incidence (about 60,000 reported cases and a downward-trend curve).

Chronic Communicable Diseases

In 1991, a total of 42,763 cases of tuberculosis were reported in the country, for an incidence of 173.1 per 100,000 population and a prevalence of 194.4 per 100,000. The pulmonary form accounted for 94.1% of all diagnosed cases, with 57.3% positive sputum smears.

In 1992, following improved case-finding among patients with respiratory symptoms and more than

466,000 sputum smear examinations (an increase of 60% over the previous year), the known incidence of tuberculosis rose to 234.0 per 100,000 population. Of the 52,552 cases identified, 21.1% were in children and adolescents under the age of 15, and there were 100 cases of tuberculous meningitis in children under 4. A total of 1,158 patients died.

The population group between the ages of 15 and 44 was the most affected, and tuberculosis ranked as the second or third leading cause of death in almost all the country's regions. Incidence was highest in the Lima metropolitan area and the departments of Ica, Tacna, Madre de Dios, and Ucayali.

An assessment of the tuberculosis control program, which involved studying patient cohorts undergoing treatment, showed that the program's efficiency increased from 74.1% of patients completing treatment in 1991 to 82.4% in 1992.

Although the behavior of leprosy in Peru is not fully understood, overall prevalence is estimated at a maximum of 0.2 per 10,000 population, although in portions of the Amazon area it may exceed 1 per 10,000. In 1991, there were 830 cases on the register in the country as a whole, but underregistration is estimated at about 75%. Of the registered cases, only 49% were being controlled, and of these, two-thirds were the lepromatous type.

Rabies

In Peru, rabies is endemic and it occurs in urban areas. Dogs are the principal reservoir, although in the central part of the jungle region there are colonies of rabies-infected bats.

A total of 10 cases of human rabies were reported in 1991, 22 in 1992, and 13 as of April 1993. The number of cases of urban rabies in animals was 239 in 1991, 348 in 1992, and 277 as of April 1993.

AIDS

There were 141 reported cases of AIDS in 1990, 155 in 1991, 194 in 1992, and about 100 as of June 1993, representing a cumulative total of more than 800 cases. During the first 6 years of the epidemic (1983–1989), the number of reported AIDS cases doubled each year; since then, it has doubled about every 2 years. The male-female ratio went from 15.5:1 in 1987 to 9.8:1 in 1992. The population aged 20 to 49 accounted for 72.0% of the cases. The predominant

mode of transmission was sexual contact (92%), and 80% was homosexual or bisexual. Most of the reported cases (87%) have been from the Lima-El Callao metropolitan area.

Nutritional Diseases and Deficiencies

According to data gathered in ENDES 1991–1992, it was estimated that 37% of the children under age 5 had some degree of chronic malnutrition (height-for-age) and 14% had severe malnutrition. In the interior, however, the rate of children with some degree of malnutrition reached a high of 54%. Lima and Arequipa had the lowest rates (14% and 20%, respectively). The survey also indicated that the national average for acute malnutrition (weight-for-age) was 11%.

The level of general malnutrition was three times higher in rural areas than in cities, and in the jungle region it was almost six times higher than in the Lima metropolitan area. The percentages were 10 times higher in children whose mothers had not had any schooling than in children whose mothers had had some higher education.

Between 1980 and 1990, per capita daily caloric intake declined from 2,074 to 1,978 calories, and daily protein consumption decreased from 52.2 g to 46.2 g.

Risk Factors

Risks in the Physical Environment

The cities that have drinking water services, including the Lima metropolitan area, have only an intermittent supply and are beset by serious water leakage problems. Some treatment plants are no longer in operation, and many places have discontinued the practice of disinfection. It is estimated that only 8% of the population with service has water 24 hours a day, and for 95% of the population the drinking water is unsafe.

On top of these deficiencies in the services, most of the sewerage systems discharge untreated wastewater into the ocean or surface waterways, and the latter's water often is used to irrigate food crops.

Air pollution problems are localized, stemming mainly from the mining and fishing industries and heavy concentrations of automotive vehicles. In particular, there are problems in Cerro de Pasco and La Oroya, generated by mining; in Chimbote, from the steel industry and fish-meal processing; in Toquepala

and Ilo, also from mining; and in Lima and El Callao, from automobiles, industrial development, and wastes, among other factors.

Deficiencies in public sanitation are due to technical shortcomings on the part of the *municipios*, which are responsible for the collection of solid waste. The health risks in this case are particularly high with regard to hospital and industrial wastes, which with few exceptions are collected and disposed of without any appropriate sanitary precautions.

Risks in the Work Environment

There is not enough information available to assess the magnitude and distribution of occupational diseases and conditions in the workplace.

Natural Disasters and Industrial Accidents

The country lies in a seismic zone, and the attendant risks pose problems for environmental health, since earthquakes affect drinking water and sewerage systems, as well as public sanitation conditions. There are also risks associated with droughts and floods.

Housing

Figures from ENDES 1991–1992 showed that 90.3% of all urban homes had electricity, whereas the proportion of rural dwellings was only 19.6%, representing 70.1% of households with electricity in the country as a whole. Piped water reached 75.2% of the urban homes but only 18.0% of the dwellings in rural areas, or 58.9% of households with piped water in the country as a whole. The proportion of homes without any sanitary services, either exclusive or shared, was 9.1% in urban areas and 63.4% in rural areas (24.6% of the total); more over, 21.3% of the urban dwellings and 74.9% of the rural ones (36.6% of the total) had sand or earthen floors.

Contamination of Food

One-third of the communicable diseases reported in Peru are transmitted by waterborne fecal matter. Except for necatoriasis and ancylostomiasis, the transmission of these diseases depends largely on the quality and safety of the food eaten by the population. The

incidence of foodborne diseases is rising steadily, and the problem is aggravated by cultural factors and the current socioeconomic crisis, which has fostered growth of the informal industry and the street vending of food—a trend that has further deteriorated hygienic and sanitary conditions.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

General Policies

In 1992, the Government of Peru set out to transform the health sector based on the following approaches: reorganization and restructuring of the Ministry of Health and the regional and subregional health directorates in the regional governments; technical and administrative streamlining of the Peruvian Social Security Institute to enable the delivery of adequate and effective services; organization and progressive implementation of comprehensive health development areas (ZONADIS), which represent the local level of the National Health System and are designed to promote and provide comprehensive health care in specific communities as a way to guarantee a universal right to health; updating laws and standards and enactment of the new Health Code, which has been in the legislature since June 1993; and development of a National Plan for Investment in Environment and Health, bearing in mind the country's economic recovery process and its savings capacity, and coordinated with the institutions of the sector.

The Ministry of Health has assigned priority to the following lines of action: control of communicable diseases with emphasis on cholera; supplementary feeding and nutrition; production, storage, and prompt distribution of generic drugs; quality control of food and drinking water, proper disposal of wastewater, and increased provision of latrines in rural and marginal urban areas; health education; transformation and development of the National Health System based on the concepts of regionalization and integration and with emphasis on local health systems; development and strengthening of immunization programs; prevention and treatment of diarrhea; control of tuberculosis, malaria and other vector-borne diseases, zoonoses, and endemic goiter; food and nutrition; comprehensive health of women, children, and adolescents; the environment; and AIDS.

Population Policies

Following promulgation of the 1985 National Population Policy Law, a Presidential Commission on Population was established, which drew up a National Population Program for 1987–1990. Since 1990, the program has received the necessary political support for its execution. The specific population policy objectives are to promote lower fertility within a context of full respect for the couple's freedom and women's rights; to encourage an even distribution of the population throughout the national territory; to promote comprehensive development of the family; to decentralize population policy to the regional governments; to foster the participation of organized groups in society in the development and evaluation of population policies; and to examine in depth and disseminate knowledge about the country's demographic reality among the participants in national development.

Health Policies and Strategies

Organization, Administration, and Decentralization. The National Health System comprises the Ministry of Health, the Peruvian Social Security Institute (IPSS), and the health services of the armed forces and the national police, the regional governments, and the *municipios*. It also includes nonpublic health services, including those in universities, professional schools, the organized community, and the private sector.

The comprehensive health development areas (ZONADIS), which target specific communities, constitute the local level of the National Health System. At this community level, correspondence is sought on the needs of particular human groups and the response capacity of the institutions. The identification of specific human groups, specific problems, and specific responses (efficient, effective, and equitable) has been emphasized.

Expenditure and Financing. During the 1980s, public expenditure deteriorated both in real terms and in the share that it represented of the GDP. The expenditure of the nonfinancial public sector went from 47.7% of the GDP in 1982 to 24.2% in 1990. At the same time, between 1982 and 1991 the Government's expenditure declined from 20.3% to 12.6% of the GDP.

According to the Inter-American Development Bank (IDB), in 1991 the imbalance in the social sector fell to 2.1% of the GDP, compared with 5.4% in 1990, owing

to a reduction in current and capital expenditures. The decrease in current expenditure was attributable to a wage freeze, downsizing of the State work force, and the sale of public enterprises. The reduction in capital expenditure was linked to a decline in investment projects, due in part to a loss of external funding.

Within the context of the social adjustment programs, a decentralized public institution has been established under the Presidency of the Council of Ministers—namely, the National Fund for Social Compensation and Development (FONCODES). Its aim is to refinance social investment projects throughout the country, particularly those that deal with employment generation, health, food programs, basic education, public sanitation, and general support for production. According to its basic tenets, the Fund gives priority to groups living in extreme poverty in rural, marginal urban, and emergency areas. FONCODES is financed by allocations from the public treasury, donations and legacies, nonreimbursable contributions of foreign governments, funding from international foundations and agencies, and internal and external loans.

Food and Nutrition. There is no policy or national plan that sets guidelines or an operational framework for addressing the problem of food and nutrition. However, the Ministry of Health has a nutrition program that focuses on breast-feeding, weaning, iron and iodine supplementation, and other nutrition-related health actions. Both the Government and the private sector are carrying out food-assistance activities.

Several agencies—the Ministries of Health, of Agriculture, of Fisheries, and of Industry, and the *municipios*—share legal responsibility for the hygienic and sanitary control of food. This situation leads to overlaps, duplication of efforts, and confusion regarding authority and jurisdiction.

Drinking Water and Sanitation. The solution for drinking water, sanitation, and other health-related environmental problems focuses on promoting increased participation by the communities themselves and by the private sector. It also calls for changes in government agencies that will make them better able to promote solutions, improve standardization, and streamline their management.

These policies are being implemented; most of the drinking water and sewerage services and all the public sanitation programs have been decentralized to the level of the *municipios*. Legal provisions have been established to encourage private investments in sanita-

tion services, and a general law on sanitation services, currently in the final stages of enactment, will lay the foundation for a new institutional and legal framework for these services, within the terms of the above-mentioned policies.

Health Technology Research and Development.

Although the National Council on Science and Technology is responsible for promoting health technology research, development, and application, the health sector has no national policy on research.

Organization of Services

Personal Health Care Services

Infrastructure. In 1992, the Ministry of Health conducted a national survey of both the public and private sectors to assess the state of the physical infrastructure, available human resources, and production and productivity. At the time of the survey, there were 17,432 physicians working in the health sector—60.2% of them in Lima, and the rest in the interior of the country. The overall ratio of physicians per 1,000 population was 0.7, with a figure of 1.6 in Lima and 0.4 in the remainder of the country. Of the total physician work force, 76.6% was employed in the public sector, and within that sector, 58.4% worked for the Ministry of Health, 30.6% for the IPSS, 8.1% for the armed forces and national police, and 2.9% for other institutions. Of those employed in the private sector (23.4%), 74.0% were working in the for-profit subsector and the rest in nonprofit institutions.

The survey identified 4,576 health establishments (hospitals, health centers, health posts, and others), of which 15.6% were located in Lima. The average population served by each establishment was 10,135 in Lima and 5,060 in the provinces. Of the 450 hospitals surveyed, 30.2% were in Lima. In terms of physical infrastructure, 93.4% belonged to the public sector, and of this amount, 90.4% corresponded to the Ministry of Health, 5.0% to the IPSS, 2.4% to the armed forces and national police, and 2.2% to other institutions. The remaining 6.6% was in the for-profit private sector. Of the country's hospitals, 56.7% belonged to the public sector, and of these, 55.4% were the property of the Ministry of Health, 26.9% corresponded to the IPSS, 12.8% to the armed forces and national police, and the remaining 4.9% to other institutions. Of the 43.3% in the private sector, 80.0% were in the private for-profit sector.

The survey also revealed that there were 20,012 hospital beds in operation, 43.7% of which were in Lima. The bed ratio per 1,000 population was 1.0 for the country as a whole, 1.5 for Lima, and 0.8 for the rest of the country. In terms of registered beds, 80.4% belonged to the public subsector, and of these, 65.8% corresponded to the Ministry of Health, 18.4% to the IPSS, 11.9% to the armed forces and national police, and 3.9% to other institutions. Of the remaining 19.6% under the private sector, 80.8% were in the private for-profit subsector.

One of the critical problems in the health services system is the population's lack of access to drugs, coupled with the fact that drugs are in short supply. Physical plant maintenance in Ministry of Health hospitals is inadequate, and it is estimated that 40% of the hospital equipment is not in working order.

The survey also provided information on hospital production in two basic areas: hospitalizations and consultations. There were a total of 655,206 discharges, 48.9% of them in Lima. The discharges corresponded to 4,153,852 bed-days, of which 56.2% were recorded in Lima. The average stay was 6.3 days for the country as a whole, with 7.3 in Lima and 5.4 in the rest. The discharge rate per 1,000 population was 27.9 for the country overall—50.5 in Lima and 19.6 elsewhere.

A total of 5,139,799 cases were treated in the country's hospitals (54.7% in Lima) and there were 8,828,259 outpatient consultations (51.1% in Lima). On average, there were 339.5 consultations per 1,000 population.

The significant difference between Lima and the rest of the country in terms of the distribution of physical and human resources prompted the Ministry of Health to propose to the IDB that an emergency initiative be undertaken—currently under way—to shore up the service network's response capacity, especially in the provinces and in marginal areas on the outskirts of Lima.

Coverage. During 1985–1992, basic health services coverage improved considerably. In 1985 the average population per health post was 11,135, while by 1992, the figure was down to 7,697. The average population per health center was 32,185 in 1985 and 22,028 in 1992. The institutions in the health services system are widely dispersed and have little coordination, and this situation limits the system's decision-making capability. The Ministry of Health provides most of the family planning coverage (36% of the total); the IPSS contributes 12% and nongovernmental organizations, 6%.

Sixty-four percent of all pregnant women receive professional prenatal care, but only 34% of women living in rural areas and 32% of those without schooling do so. The difference is particularly notable in the grand multiparas: only 43% of the pregnancies corresponding to birth order 6 or higher have the benefit of professional prenatal care (one in every five births corresponds to birth order 6 or higher), while 77% of the mothers of first-born children had professional prenatal monitoring. Of the women that received care, the median gestational age at the time of the first visit was 3.4 months, and 47% of the women made four or more prenatal visits.

Only 46% of the deliveries took place in health service establishments, and the proportion of home deliveries was 83% in rural areas and 85% among women without schooling. Births attended by professional personnel represented 53% of the national total, but the proportion was only 19% in rural areas and 16% among women without schooling. While midwives attended 29% of the deliveries nationwide, many women were cared for by family members (18%). Family members attended 33% of the deliveries in rural areas and 39% of those by women without schooling. In the highlands this figure was nearly the same as deliveries attended by midwives (31% versus 38%), and in four areas family members attended most deliveries.

In 1991 and 1992, vaccination coverage in infants under 1 year of age was 74.4% and 84.6%, respectively, for the three doses of poliovaccine, 71.0% and 82.9% for three doses of DPT, 59.7% and 83.3% for measles vaccine, and 78.5% and 85.2% for BCG.

The Ministry of Health and several nongovernmental organizations carry out food aid programs targeted primarily to population groups at high nutritional risk. The Ministry's programs include the Family Food and Nutrition Program, which benefits 110,000 families consisting of a single mother and at least two children under the age of 5, as well as 185,000 schoolchildren; the Maternal and Child Food Program, which works with the World Food Program; the National Food Program, which reaches preschoolers, mothers' clubs, and 196,364 children under the age of 5; the Program for Abandoned Children at Nutritional Risk, which benefits 8,486 street children under the age of 11; and the Food and Nutrition Program for Tuberculosis Patients, which provides assistance for persons in this vulnerable group. Together, these programs mobilize 20,000 metric tons of food a year. The programs of nongovernmental organizations, in turn, provide 125,000 metric tons of food a year for mothers

and children, in addition to food aid in recent fringe settlements.

Environmental Services

Infrastructure. As a result of the State's reorganization, the decentralization process, and the promotion of private sector participation, central-level government institutions that have been responsible for environmental health are being restructured or disbanded, and new institutions are being created. Chief among the latter is the recently established National Sanitation Services Authority, which has the functional, financial, and administrative autonomy to propose standards for the provision of services in drinking water supply, sewerage and rainwater drainage systems, sanitary excreta disposal, reutilization of wastewater, and public sanitation, as well as to oversee the delivery of these services, evaluate the performance of the entities that provide them, impose such penalties as may be specified under the prevailing public health legislation, and collect the fines and rates that are stipulated in this legislation.

The rehabilitation and expansion of environmental services is funded largely from national sources. The country's financial isolation has severely limited the influx of resources from abroad. However, Peru's re-entry into the international financial community now enables it to initiate negotiations for loans, including a loan for Lima's drinking water and sewerage services through the World Bank and another one for services in the interior of the country through the IDB.

Services. According to data from the executive unit of the National Drinking Water and Sewerage Program, in 1992, 76.5% of the urban population was supplied with drinking water services and 60.5% had sewerage services; in rural areas 23.7% had access to drinking water services and 17.4% to sewerage services.

The cholera epidemic led to an initiative to disinfect the country's drinking water supplies. Specific standards have been established in this regard, and compliance has been overseen. With external cooperation, equipment was installed for both water disinfection and laboratory quality control.

Although it is difficult to obtain information on Peru's sanitary waste management, some studies indicate that an estimated 48% of the country's paved streets (representing 30% of all the country's streets), are regularly swept, and solid waste collection

is provided for 60% to 65% of the population. The Lima metropolitan area and the cities of Piura, Trujillo, and Tacna use some form of landfill for the disposal of waste; the rest of the cities, however, deposit their waste in untreated dumps or jettison it into water courses.

The cholera epidemic has given rise to a vigorous public information campaign to alert the population to the risk of eating food prepared under inadequate sanitary conditions, especially food sold in the streets.

The main institutions directly involved in workers' health are the National Institute of Occupational Health, the Ministry of Health, the General Bureau of Occupational Health and Safety, the Ministry of Labor and Social Welfare, and the IPSS. It is estimated that 40% of the work force is covered by the social security system and receives health benefits, chiefly for restorative care, while the remaining 60% receive no assistance at all.

The Ministry of Transportation, Communication, Housing, and Construction is responsible for promoting new construction and improving housing conditions. There is a National Housing Fund, supported by workers' contributions, whose purpose has been expanded to include sanitation, electrification, and road-building projects.

Environmental health in the event of disasters comes under the National Civil Defense System.

The Coordinating Committee of the National Toxicology Network was established to ensure that due attention is given to toxicology, that preventive measures are taken, and that the health and environmental risks involving poisons are brought under control.

With support from the European Community Commission, the National Meteorological and Hydrological Service has been carrying out a project since 1990 that entails the assessment and surveillance of air pollution from particulate matter and carbon monoxide in the Lima metropolitan area.

Social and Community Participation

Since 1990, before the crisis worsened and its consequent social impact was experienced fully, a process was initiated involving a dialogue between the State and organized civil groups that met in local fora. Many local-action committees have groups to fight against cholera, and intersectoral efforts have been created, all of which have helped to break down the barriers among the popular organizations, State health and educational institutions, local governments, and non-governmental organizations and, thus, have promoted health and improved the quality of life for the more vulnerable sectors of the population.

PUERTO RICO

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

The Government of Puerto Rico is focused on addressing those factors that will make the greatest short- and medium-term contributions toward an improved quality of life for the population and toward laying the groundwork so that the gains achieved will be lasting. At the head of its list of priorities, therefore, are the safety and protection of the population, improvement of education, reorganization of the government so that it will become an instrument of change and a stimulus for economic and social development, quantitative and qualitative improvement of both the preventive and the curative health systems, acceleration of economic development in all sectors with a view to both maintaining and generating jobs, and effective maintenance and expansion of the economic infrastructure.

Since 1985 the Puerto Rico Planning Board has been calculating the index of economic activity (IEA) based on the following variables: total employment, employment in the manufacturing sector, payroll and hours worked by production employees in the manufacturing sector, foreign trade, occupancy rates in the tourist hotels, total value of building permits for new housing units, retail sales, total taxes, commercial and industrial consumption of electric power, production of cement, and first-time registrations of motor vehicles. The cumulative IEA for fiscal year (FY) 1993 (July 1992–June 1993) was 148.6, representing an increase of 2.3 points over FY 1992, when it was 146.3. This increase reflects a resurgence of economic activity in FY 1993, confirming that the economy has moved out of a period of stagnation and is now embarked on moderate growth.

Total employment showed an upturn during the third quarter of FY 1993. As of March 1993 there were 997,000 employed workers, or an increase of 2.4% with respect to the same period in FY 1992.

During FY 1992, investments in new construction amounted to US\$ 497.4 million, up 1.3% from FY 1991.

According to information available through May of FY 1993, the trend for the tourist industry was positive. The total of 901,555 registered guests in Puerto Rico's hotels during FY 1993 represented an increase of 9.0% over the same period in FY 1992.

Employment in manufacturing was down 1.3%, compared with a drop of only 0.4% in 1992; the cumulative total of employees in FY 1993 stood at 149,800, versus 151,900 in FY 1992. These figures contrast with an increase of 5.9% in the number of employees engaged in production in 1993, following a rise of 4.8% in 1992. Also, the number of hours worked per month increased by 0.3% during the same period.

The consumer price index as of April 1993 was up 2.6%, compared with 1.5% in 1992. The area that experienced the biggest increase (5.3%) was food and beverages.

Population

The number of births decreased from 66,555 in 1990 to 64,516 in 1991, while the number of deaths went up slightly, from 26,148 in 1990 to 26,328 in 1991. The crude mortality rate remained constant at 7.4 per 1,000 population. In 1990 net migration was -15,197 persons—in other words, more people left Puerto Rico than entered.

According to the 1990 population census, of the total of 3,522,037 inhabitants, 1,705,642 (48.4%) were males and 1,816,395 (51.6%) were females. In terms of age distribution, 27.2% of the population was under 14 years old, 17.5% was between 15 and 24 years old, 45.6% was aged 25 to 64, and 9.7% was 65 or over. The median age was 28.5 years.

The estimated population in 1991 was 3,549,160, or 0.6% more than in 1990. A total of 38,118 people were added to the population as a result of natural growth (the difference between 64,516 births and 26,328 deaths).

In 1991 the birth rate was 18.2 per 1,000 population, compared with 18.9 in 1990. Of the 64,516 live births in 1991 (2,039 fewer than in 1990), 51.5% (33,198) were males and 48.5% were females. Almost all the births

(64,343, or 99.7%) occurred in hospital—61.5% (39,669) in public hospitals and the rest in private hospitals. The remaining 0.3% (173 births) took place at home, on the way to the hospital, in other places, or at unspecified locations.

In 1991, 5,973 of the newborns, or 9.26%, had a low birthweight (under 2,500 g). This was a slight increase over 1990, when the figure was 9.14%. The proportion of low-birthweight babies went up 3 years in succession (1989, 1990, and 1991), while the proportion with very low birthweight (under 1,500 g) declined very slightly from 1.18% in 1990 to 1.16% in 1991. The Caguas Health Region had the highest percentage of low birthweight. Of the low-weight births in 1991, 22.7% (1,357) were to teenage mothers, while in 1990 this proportion was 22.9%.

The same pattern was seen in both the public and private health sectors: in the former there was a slow but steady rise in the proportion of low birthweight, from 10.4% in 1988 to 11.1% in 1992, and in the latter there was also an increase, from 5.79% in 1987 to 6.63% in 1992.

Mortality

Diseases of the heart and malignant neoplasms were the two leading causes of death, together accounting for 37.5% of all mortality.

Diseases of the heart remained in first place in 1992, when a total of 5,868 persons died from this group of causes. The broader category of cardiovascular diseases (which includes diseases of the heart, cerebrovascular disease, hypertensive disease, and arteriosclerosis) accounted for 8,396 deaths, or 30.6% of the total.

Among males there were 2,580 deaths from malignant neoplasms. The most frequent site was the prostate, which was associated with 517 deaths (20.0%), followed by the trachea, bronchus, and lung, with 377 deaths (14.6%). In females there were 1,813 cancer deaths: the breast was the number one site, accounting for 311 deaths (17.2%), followed by the trachea, bronchus, and lung, with 180 (9.9%).

In 1992 diabetes mellitus was the third leading cause of death, as it had been in 1990 and 1991. The toll from this cause in 1992 was 1,836 (836 males and 1,000 females), or 6.7% of all deaths. In 1991 there were 1,668 deaths from this cause (734 males and 934 females).

In fourth place was mortality from HIV infection/acquired immunodeficiency syndrome (AIDS). A total

of 1,420 deaths were reported from this cause: 1,162 (81.8%) in males and 258 (18.2%) in females.

Cerebrovascular disease ranked fifth, with 1,285 deaths (4.7% of the total).

A comparison of adjusted rates, taking the Puerto Rican population figures from the 1990 census as the standard, shows that mortality from hypertensive disease, chronic liver disease and cirrhosis, perinatal conditions, and arteriosclerosis declined from 1991 to 1992. The opposite was true for malignant neoplasms, diabetes, AIDS, cerebrovascular disease, chronic obstructive pulmonary disease (COPD), pneumonia, homicide, septicemia, and nephrosis, all of which showed increases even after the rates were adjusted. The most marked increases were in mortality from AIDS (11.5%), diabetes (9.1%), COPD (10.3%), and septicemia (13.1%). Deaths from diseases of the heart did not increase in real terms, since the adjusted rate was 163.2 per 100,000 population both in 1991 and 1992. The increase from 161.4 to 164.0 in the crude rate was due to the change in the population's age structure (the population was older in 1992 than in 1991), rather than to greater mortality from diseases of the heart.

Morbidity

In 1989 a total of 4.5 million chronic conditions were reported among the noninstitutionalized civilian population of Puerto Rico. In each successive age group, the rate of chronic conditions goes up. The rate begins to rise at the age of 17 and ultimately reaches a level of 354.0 chronic conditions for every 100 persons aged 65 and over. As in previous years, diseases of the circulatory system ranked first in 1989, with a rate of 25.1 conditions per 100 persons. Next in frequency are diseases of the respiratory system (at 17.8 per 100), diseases of the musculoskeletal system and connective tissue (13.3 per 100), diseases of the endocrine glands (9.0 per 100), and diseases of the digestive system (7.8 per 100).

In proportional terms, the most prevalent conditions are arthritis and rheumatism, hypertensive disease, asthma, diseases of the heart, and diabetes, which together represent almost one-third (30.9%) of all chronic conditions. These diseases show similar patterns with regard to mortality. According to the Annual Vital Statistics Reports for 1989 and 1991, diseases of the heart, diabetes mellitus, chronic obstructive pulmonary disease (including asthma), and hypertensive disease were among the 15 leading causes of death.

Women had a higher rate of chronic conditions (144.8 cases per 100) than men (110.1 per 100).

The Health Interview Survey is a field study conducted by the Office of Health Statistics of the Health Facilities and Services Administration, Department of Health. The survey provides statistical data on hospitalizations, visits to physicians and dentists, acute and chronic morbidity, and days of restricted activity associated with these conditions.

During 1989, according to data from two 3-month sample periods, the estimated incidence of acute morbidity in the noninstitutionalized civilian population of Puerto Rico was 5.9 million episodes. This rate represented a decline of 8.6% with respect to 1988.

Decreased incidences of the common cold, influenza, and gastroenteritis contributed the most to the overall reduction in the number of acute illnesses in 1989. Females had a higher rate of acute illness (178.9 per 100) than males (158.5 per 100).

The incidence of acute illness tends to vary with age. Children under 6 years had the highest rate (339.4 per 100 per year), while the lowest rates were in the groups aged 17 to 24 and 65 and over (122.0 and 124.7 per 100 per year, respectively).

Diseases of the respiratory system had the highest incidence among acute conditions in 1989, with a rate of 81.5 per 100 persons, followed in order by infectious and parasitic diseases (28.8 per 100), injuries (17.2 per 100), and diseases of the digestive system (11.3 per 100). Within these broad categories, the acute conditions with the highest incidence were the common cold and influenza (63.5 episodes per 100 persons), under the category diseases of the respiratory system; dysentery and gastroenteritis (16.9 per 100), under infectious and parasitic diseases; fractures (2.1 per 100) and dislocations (1.2 per 100), under injuries; and diseases of the stomach and duodenum (1.7 per 100), under diseases of the digestive system.

SPECIFIC HEALTH PROBLEMS

Puerto Rico has experienced a social transformation in the last 50 years that has brought with it a significant increase in longevity and life expectancy. It is expected that this pattern will continue and that by the year 2030, 15% of the population will be 65 years of age or older. This and other trends, such as the passage from a rural agricultural society to an urban industrial one, have entailed changes in morbidity and mortality. Within the new epidemiologic profile, acute infectious tropical diseases coexist alongside chronic degenerative diseases, and the prevalence of cardiovascular diseases and cancer is high. Alcohol abuse and smoking

are common, the population is sedentary, the diet contains too much fat and protein, and drug consumption is on the increase.

Analysis by Population Group

Perinatal and Child Health

Children under 6 years of age had the highest incidence of the common cold and influenza, with a rate of 143.1 episodes per 100 children per year. In the category of infectious and parasitic diseases, the incidence of dysentery and gastroenteritis was 30.4 per 100.

In the category of injuries, the group aged 6 to 16 years had the highest rate of fractures (7.0 per 100).

The disease of the digestive system with the highest rate in children under 6 was unspecified gastritis and colitis (14.2 per 100).

In 1991 there were a total of 841 infant deaths (625 neonatal and 215 postneonatal). Table 1 lists the five leading causes of infant mortality in 1991.

Adolescent and Adult Health

Diseases of the circulatory system tend to appear after the age of 45; their highest prevalence is seen in the population 65 and over. Diseases of the musculoskeletal system and connective tissue follow a similar trend.

Arthritis and rheumatism are the most prevalent conditions within the group of diseases of the musculoskeletal system, the highest rates being registered in the adult and elderly population.

Homicides are the leading cause of death in the population 15 to 19 years of age. In 1992 a total of 118 homicides occurred in this age group, and 111 of the victims were males. In this age group there were also 14 suicides, all of them in males (five committed with firearms).

In 1991 there were 73.0 live births among every 1,000 women 15 to 19 years of age.

Health of Women

Of a total estimated population of 3,549,160 in 1991, 1,830,384 were females. One of the most significant changes that has taken place in the Puerto Rican family is the proportional growth in women heads of house-

TABLE 1
Leading causes of infant, neonatal, and postneonatal mortality, Puerto Rico, 1991.

| Cause of death (ICD-9) | Number of deaths | | |
|---|------------------|----------|--------------|
| | Infant | Neonatal | Postneonatal |
| All causes | 841 ^a | 625 | 215 |
| Disorders relating to short gestation and low birthweight (765) | 189 ^a | 182 | 6 |
| Congenital anomalies (740-759) | 149 | 101 | 48 |
| Respiratory distress syndrome (769) | 142 | 137 | 5 |
| Pneumonia and influenza (480-487) | 38 | 6 | 32 |
| Infections specific to perinatal period (771) | 33 | 28 | 5 |
| Accidents and adverse effects (E800-E949) | 11 | — | 11 |
| Intrauterine hypoxia and birth asphyxia (768) | 10 | 8 | 2 |
| Septicemia (038) | 9 | — | 9 |
| Meningitis (320-322) | 8 | 4 | 4 |
| Sudden infant death syndrome (798.0) | 7 | 1 | 6 |

^aIncludes one infant death of unspecified age.

Source: Department of Health, Health Facilities and Services Administration. *Informe Anual de Estadísticas Vitales, 1991*. San Juan, 1992.

hold. According to 1990 data, one in every five households (19.5%) is headed by a woman.

In 1992 a total of 12,374 children were born to mothers under the age of 20, or 19.2% of all births, compared with 12,212, or 18.9%, in 1991, 18.8% in 1990, and 18.0% in 1989. Of the teenage mothers who gave birth to 12,374 babies in 1992, 60% (7,374) were unwed, compared with 57.8% of all the teenage mothers in 1991 (7,055 in a total of 12,212 births) and 55.6% in 1990. The proportion of unwed mothers among women of all ages who gave birth in 1990 was 36.8%. This proportion has been on the rise since 1977, when it was 18.6%; in 1991 it stood at 38.2% (24,662 out of 64,516 births).

In the case of 73.0% (47,120) of the births in 1991, the mothers had received prenatal care since the first trimester. This proportion represented an increase over the year before, when it was 70.8%. Only 769 (1.2%) of the mothers received no prenatal care whatsoever, and of these, 623 (81.0%) were unwed. Of the 3,893 mothers who had fewer than five prenatal check-ups, 2,592 (66.6%) were unmarried.

The rate of cesarean sections was 30.1% in 1989 and 31.0% in 1990. In 1991, a total of 20,388 cesareans were performed, for a rate of 31.6 for every 100 births—21.3 per 100 in public hospitals and 49.0 in private hospitals.

Anemia, hypertension associated with pregnancy, and diabetes were the three most frequent risk factors in pregnancy, with rates of 30.9, 29.5, and 17.7 per 1,000 live births, respectively.

Of the 26,328 persons who died in 1991, 10,751 were females. The leading causes of death in women were diseases of the heart (2,623 deaths), malignant neo-

plasms (1,725), diabetes mellitus (934), cerebrovascular disease (597), and pneumonia and influenza (508); the remaining 4,364 deaths were due to other causes.

Health of the Elderly

In 1990, 13.1% of the people in Puerto Rico were 60 years of age or older. It is expected that by the year 2000 this group will constitute 15.2% of the population. This change is due mainly to the impressive decline in mortality, the improvement of socioeconomic conditions, the falling birth rate, the immigration of older persons from the United States, and the emigration of young persons (16 to 35 years of age) to the United States and other countries.

About half the elderly live in the following parts of the country: the San Juan Metropolitan Area (19.9%), the south (16.0%), and the west (15.5%). Most of the elderly live in the community; fewer than 2% are in institutions.

The leading causes of death in this age group are diseases of the heart, malignant neoplasms, cerebrovascular disease, pneumonia, and diabetes. Other leading causes are arteriosclerosis, accidents, cirrhosis of the liver, and nephritis.

Although the economic situation of the elderly in Puerto Rico has changed considerably over the years, this population group probably remains the poorest. According to the 1980 census, there were 44,505 people aged 60 and over living in public housing. Approximately 230,010 relied on Social Security payments as their chief source of income, and their average annual

benefits totaled US\$ 3,456. In the group aged 60 and over, 147,161 people benefit from the Nutritional Assistance Program, and an additional 18,753 persons aged 65 and over are beneficiaries under the public assistance programs administered by the Government through the Department of Social Services.

The elderly population is largely outside the labor market. Of the 586,000 persons aged 55 and older, only 107,000 are in the work force. The median annual earnings of workers aged 60 and over is US\$ 3,293.

Workers' Health

Of the 1,184,000 persons in the economically active population in 1992, 83% were employed and the average unemployment rate was 16.7%. Table 2 shows the supply and demand in certain occupations in 1992.

As the economy has shifted from an agricultural to an industrial focus, the participation of women in the work force has increased, with favorable effects on economic development.

There are marked differences between the sexes in terms of occupations. The largest number of employed women are office workers. Professionals, technicians, and similar workers are the next most numerous, and in third place are laborers. For men the three most important categories are artisans, foremen, and similar workers; laborers; and managers, administrators, and civil servants.

Law 45 of 1935 established regulations for the workmen's accident compensation program and created a government agency called the National Insurance Fund. This agency's purpose, as stated in the law, was to promote the welfare of the inhabitants of Puerto Rico by providing coverage for any accident in the workplace that causes injury or death and for any occupational disease or related death. The law further stated that employers have the obligation to compensate workers or beneficiaries, as defined under this law, in the event of an occupational illness or death or a workplace injury or death, even if there was no negligence, and to arrange the means and methods for fulfilling this obligation. Finally, the law specified the form that the insurance should take and the regulations governing it.

The Administrative Services Program and its regional offices handle matters relating to workers' insurance and claims for work-related accidents for employers and workers throughout Puerto Rico. In FY 1991, 69,846 of the country's 963,000 employed persons filed cases. In FY 1992, the figures were 75,799 cases

TABLE 2
Occupational supply and demand, Puerto Rico, 1992.

| Occupation | Supply | Demand |
|---|---------|---------|
| Executive, administrative, and managerial posts | 90,453 | 81,550 |
| Professionals | 128,649 | 117,773 |
| Sales | 114,651 | 99,604 |
| Administrative support Services | 164,307 | 144,541 |
| | 158,186 | 131,588 |

Source: Puerto Rico Planning Board, Coordinating Committee on Occupational Information. Data on occupational supply and demand for 1992 and projections for 1995; 1993.

out of 978,000 workers, and in FY 1993, 78,651 cases and 999,000 workers.

A total of 21,587 disability certificates were issued in FY 1991. The figures for FY 1992 and FY 1993 were 20,275 and 23,872, respectively.

Diseases and Health Impairments

Vector-borne Diseases

There were 9,540 suspected cases of dengue in 1990, 10,305 in 1991, and 13,654 in 1992. The proliferation of disposable containers, old automobile tires, abandoned vehicles, and discarded household appliances such as refrigerators and washing machines has created an environmental problem which is aggravated by the presence of vacant buildings, shops, and lots, as well as waste tossed onto streets, along highways, and elsewhere.

Vaccine-preventable Diseases

In 1991 there were two reported deaths from tetanus, both in males. No deaths from diphtheria, whooping cough, scarlet fever, or measles were reported.

Cholera

The statistical reports for 1990, 1991, and 1992 show that there were no reported cases of cholera.

Chronic Communicable Diseases

Tuberculosis continues to be a public health problem in Puerto Rico. The impact of human immunodeficiency

ciency virus, the deteriorating health services infrastructure, and other social factors have contributed to an increase in tuberculosis morbidity. At the same time, the increased incidence of the disease has changed the dynamics of its transmission in the general population.

The occurrence of nosocomial outbreaks of tuberculosis has been a source of concern for health professionals. In an effort to prevent such outbreaks, the Tuberculosis Program has begun to evaluate the practices being used to control and prevent the disease in the health system's public hospitals.

In 1991 there were 56 reported deaths from tuberculosis—39 in men and 17 in women.

Respiratory Diseases

In 1989 diseases of the respiratory system were the most frequent cause of illness, with a morbidity rate of 21.8 conditions per 100 children under the age of 6. The overall rate for asthma was 7.7 per 100 persons, but the prevalence was greater in children and adolescents (17.8 and 11.7 per 100, respectively). Next in order of importance were allergies, for which the overall rate was 4.9 per 100, with the highest prevalence in the 17-to-24 age group (7.3 per 100).

Pneumonia, the fifth-ranking cause of death in 1990, fell to seventh place in 1991 (1,193 deaths in 1990 and 1,118 in 1991). Chronic obstructive pulmonary disease (bronchitis, emphysema, asthma, bronchiectasis, allergic alveolitis, and bronchiolitis) ranked ninth as a cause of death in 1990 and 1991.

In 1992 pneumonia and influenza constituted one of the top five causes of death in the age groups 0 to 3 years, 25 to 29, and 80 and over. In that same year, chronic obstructive pulmonary disease was one of the leading causes of death in the group aged 65 to 79.

Rabies

Because of the disease's complexity, a manual on the management of rabies was prepared and distributed throughout Puerto Rico—to public and private hospitals and veterinarians' offices and to environmental health officials. During the period 1990–1992 a total of 21 confirmed cases were reported in dogs, 6 in cats, 176 in mongooses, and 10 in various other species. No cases were reported in humans.

AIDS and Other Sexually Transmitted Diseases

In 1991 AIDS rose to fourth place as a cause of death in Puerto Rico, whereas in 1989 and 1990 it had been in seventh place. In 1991 it was ahead of cerebrovascular disease, pneumonia, and accidents, which in 1990 ranked fourth, fifth, and sixth, respectively. Of the 1,267 persons who died from AIDS in 1991, 1,065 (84%) were between the ages of 25 and 49.

As of December 1993 the cumulative total of confirmed cases of AIDS was 12,131, of which 7,102 (59%) had died. The incidence continued to be highest in persons 20 to 49 years of age, and confirmed cases of AIDS in men represented 79% of the total. In Puerto Rico intravenous drug use is the most important risk factor for contracting this disease.

In 1991 there were four reported deaths (three women and one man) from syphilis.

Nutritional and Metabolic Diseases and Deficiencies

In 1992 diabetes mellitus was the third-ranking cause of death, accounting for 6.7% of total deaths. Of the 1,836 deaths from this cause, 836 (48.2%) were in men and 1,000 (54.2%) in women. The disease mainly affects persons 55 and over.

Cardiovascular Diseases

According to 1989 data, the most frequent disorders of the circulatory system were hypertension and diseases of the heart, with rates of 10.1 and 5.7 per 100 persons, respectively. These conditions were found mainly in the population aged 45 to 64 and those aged 65 and over. For the same two age groups, the rates for hypertensive disease were 26.0 and 35.3 per 100 persons, and for diseases of the heart, 10.9 and 24.9 per 100, respectively.

In 1991 cardiovascular diseases, including diseases of the heart, cerebrovascular disease, hypertension, and arteriosclerosis, caused 8,282 deaths, representing 31.4% of all mortality during that year.

Malignant Neoplasms

Malignant neoplasms were the second leading cause of death in Puerto Rico in 1991, claiming a total of 4,274 lives. In 1992 the number of deaths increased by 119,

but the cause continued to rank second. The most frequent sites were the digestive organs and the peritoneum (1,423 deaths in 1991), the genitourinary organs (777), and the respiratory and intrathoracic organs (661). Within the latter two categories, malignant tumors of trachea, bronchus, and lung caused 550 deaths and those of prostate caused 425.

Accidents and Violence

In 1992 accidents were the sixth-ranking cause of death, with a toll of 1,209. In that year accidents ranked first among the group aged 2 to 14 years, accounting for 67 deaths (5.6%), and second in the groups aged 15 to 24 (189 deaths, 15.6%), and 30 to 39 (196 deaths, 16.2%). They were the 11th cause in the population 80 years old and over, accounting for 119 deaths (9.8%).

Fifty percent of the deaths from accidents involve motor vehicles. The mortality rate in males from such accidents was 12.1 per 100,000 population in 1982 and 13.5 per 100,000 in 1992. In the last 10 years, approximately 25% of all the deaths from motor vehicle traffic accidents occurred in young people between the ages of 15 and 24. In 1992 this proportion was 20.4%, and 38% of motor vehicle traffic deaths occurred in the 25-to-34 age group.

Accidental falls are the second most frequent type of accident, representing 13.6% of all accidental deaths in 1992. That year, approximately 50% of the deaths from falls occurred in persons aged 75 and over. Deaths from accidental drowning and suffocation accounted for 11.9% of the deaths from accidents.

Homicide ranked 10th overall as a cause of death in 1992, but in the age groups 15 to 24 and 25 to 34 it was among the first three causes of death. Of the 851 homicides that year, 558 (65.6%) of the victims were 15 to 34 years of age, and 512 were males.

Of the 314 deaths from suicide in 1992, 279 (88.9%) were in men and 35 in women. Suicide was among the five leading causes of death in the group aged 25 to 34 years.

Behavioral Disorders

Epidemiologic studies have shown that alcoholism is one of the most prevalent mental disorders. About 13% of the population has met the diagnostic criteria of alcoholism at some time in their life, and 5% did so within the 6 months prior to the interview. It is esti-

mated that there are 100,000 alcoholics in Puerto Rico, of whom only 10% receive treatment provided by the Department of Addiction Services.

An epidemiologic study on the prevalence of mental disorders in the adult population of Puerto Rico revealed that the prevalence of drug abuse and dependence was 1.24%, meaning that some 22,222 persons were affected. The prevalence of illicit drug use was found to be 8.2% in the population aged 17 to 64 (146,954 persons out of a total population of 1,792,127 in that age group). A subsequent methodologic study of these findings concluded that the prevalence was underestimated.

In 1991 there were 353 deaths associated with mental disorders (269 in men and 84 in women). Of those deaths, 281 were from neurotic and personality disorders and other nonpsychotic mental disorders (225 in men and 56 in women).

Oral Health

Only a few sporadic epidemiologic studies have been conducted on this subject in Puerto Rico, and it is therefore impossible to identify a trend in the indexes of oral health status. In 1948 the DMF index (teeth decayed, missing, and filled) was 8.6 in schoolchildren from different parts of the island; in 1970 it was 4.5 for schoolchildren in the San Juan Metropolitan Area; and in 1992 it was 3.52 for children between the ages of 5 and 14 years in that same area. Thus, there was a slight reduction in the occurrence of caries among San Juan schoolchildren over the 22-year period.

The available human and financial resources are not sufficient to provide the curative and restorative treatment needed by the country's indigent population.

Puerto Rico was the first country in the world to pass legislation calling for the fluoridation of water. But recently, this practice has been discontinued, despite the fact that it is the most cost-effective method known for the prevention of dental caries.

Puerto Rico ranks fourth in the world in the incidence of oral cancer.

Risk Factors

Risks in the Physical Environment

Drinking water is delivered to 97.3% of Puerto Rico's population by the Water Supply and Sewerage

Authority. The remaining 2.7% (94,057 persons) get their water from smaller systems outside the Authority, which lacks the capacity to deliver water service to certain rural areas, frequently because they are inaccessible or because of high cost.

There are 241 community water systems, 70% of which do not treat the water to make it potable. The sources for most of these systems are unprotected underground or surface water bodies; 80% of the systems fail to meet requirements for the elimination of coliform bacteria, and, therefore have been classified as systems in continuous violation of bacteriological standards.

One of the major factors contributing to the situation outlined above is the fact that the nonprofit organizations that manage these community systems do not charge for the water actually used, but instead simply collect a quota contribution from each household. The organizations then use the money to cover costs such as repairs and the electric power used in pumping, and as a result, there is not enough money to buy disinfection equipment, chemicals, or tanks. The people who manage these systems are community volunteers who donate their services.

The Federal Code requires that water samples be regularly tested for trihalomethanes in any community system that serves more than 10,000 inhabitants, and that disinfectants be used in the treatment. This regulation is applied in 74 of Puerto Rico's water systems; all of these systems are in compliance, except for the one that serves the San Juan Metropolitan Area, which supplies the largest population of any of them.

Amendments to the Safe Drinking Water Law stipulate that filtration should be used in surface water systems and those subterranean water systems that are affected by runoff, in order to reduce the risk of contamination with the intestinal protozoa *Giardia* as much as possible. Puerto Rico has 42 surface water systems administered by the Water Supply and Sewerage Authority that still do not use filtration in their treatment process.

There are no health problems in Puerto Rico stemming from the consumption of contaminated milk because all dairy products are thoroughly inspected and monitored through every stage of production to the point of sale.

The Division of Public Health in the Immediate Physical Environment is responsible for protecting the population against vector-borne communicable diseases, especially dengue. The Division's activities in

1992 included 22,905 visits to residential sites in response to 7,018 complaints, 74 cleanup campaigns in the most affected communities, and sanitation surveys to determine the nature and magnitude of environmental hygiene problems.

Risks in the Work Environment

Services for injured workers are provided in the Industrial Hospital; in regional, local, and industrial health centers; and in certain clinics and hospitals that operate under government contract. A total of 10,342 cases were attended in the Emergency Room of the Industrial Hospital in 1991–1992, for an average of 28 cases a day. At the same hospital, there were a total of 2,921 admissions and the average stay was 9.9 days. The clinics, in turn, attended 45,638 patients. There were seven deaths in the industrial sector.

Housing and Urbanization

Puerto Rico is predominantly urban. Whereas in 1960 only 44.2% of the population lived in urban areas, in 1990 this proportion had increased to 71.2%. The San Juan Metropolitan Area continues to attract most of the population.

According to data from the 1990 Population and Housing Census, Puerto Rico had a total of 1,188,985 housing units (an increase of 21.6% since the 1980 Population Census in the context of a growth rate of 1.8% since 1980), of which 88.7% were occupied. Of the unoccupied dwellings, 27.3% were for sale or rent. In the 1990 census, 90.4% of the occupied dwellings were characterized as being in good condition, compared with 83.0% in 1980; only 4.17% of the dwellings were classified as inadequate.

Contamination of Food

The Program of Food Preparation and Service Hygiene is responsible for seeing that food quality does not become a public health problem. During fiscal year 1992–1993, a total of 12,360 registered establishments were inspected; 25 courses were given for food handlers working in this industry; and tests were run on 5,092 samples from utensils and 274 food samples, 187 of the latter for bacteriological analysis and 87 for chemical analysis.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

General Policies

Elections were held in the United States of America and Puerto Rico in 1992. Since Puerto Rico is a Commonwealth of the United States, the political, economic, and social processes of the latter nation directly affect the island. The new administration in the United States has drawn up plans for health service reform and will propose a series of complex and wide-ranging social and economic changes.

The 1992 elections brought new leadership in Puerto Rico, and with it, a new government program.

Health Policies and Strategies

Health Reform. Under the new model for delivering health care to indigent patients, the quality of health services will improve and the barriers which up to now have stood in the way of access to health services at the primary, secondary, and tertiary level will be lifted.

Puerto Rico's health services system includes both the public and the private sector. Two factors remain as critical problems: (1) costs in the private sector and to groups covered by health insurance are rising out of control, and (2) too many people do not have access to adequate health care. Both these factors stem in large part from the rising cost of providing care and from the fact that health insurance is largely available only to full-time employees of large businesses and the Government.

The fundamental goal of the proposed health care reform is to check the sharp rise in costs and ensure that the entire population has access to quality care at a reasonable cost. This goal can be achieved by providing universal access to essential medical care, controlling the cost of health care, restructuring the health services system, setting and maintaining high levels of health care quality, emphasizing primary level services, and ensuring that everyone pays their fair share.

Coverage should include all the necessary services to ensure good physical and mental health for the entire population, including outpatient, medical, surgical, hospital, laboratory, dental, and pharmaceutical services. The amount of the insurance premium and

the schedule of deductibles will be dictated by the beneficiary's ability to pay. The beneficiary will be able to select providers from a list of contracted professionals.

The plan will be implemented in stages, and each stage will be evaluated in-depth, in order to ensure the plan's overall continuity and viability. The transition will be gradual and will stretch for at least 8 years.

Organization and Administration of Health Sector Institutions: Decentralization and Development of Local Health Systems. A priority goal involves the reorganization of health regions and the delivery of services at primary, secondary, and tertiary levels, with special attention to avoiding duplication of services.

The strategies are as follows: establishment of central and regional interdisciplinary working groups to develop and implement an evaluation model for use in the regions; preparation of guidelines for each level of services; improvement and streamlining of the referral system from one level to another; and enlistment of installations at the different levels, along with community organizations, to serve as hubs for the dissemination of health information in mass campaigns.

Another priority is the upgrading of the health system's operation, with emphasis on streamlining administrative procedures. The following strategies have been proposed for bringing this about: analysis and categorization of the list of needs submitted by the operational areas; exploration of self-financing schemes to generate income; and the establishment of mechanisms for analyzing, monitoring, and evaluating plans in order to measure progress, identify factors that may stand in the way of their effective or efficient implementation, and determine the need for changes.

Human Resources. The priority goal is to establish mechanisms for maximizing the utilization of human and physical resources in the Health Department and its Health Facilities and Services Administration.

The strategies include identifying necessary resources in all the regions based on the characteristics of their respective populations; conducting a comparative study of existing staffing patterns in the programs and institutions in all the regions; developing a methodology for identifying essential staffing patterns and ascertaining the need for additional personnel; and implementing mechanisms for the redistribution or reassignment of current staff.

Expenditure and Financing. The priority is to establish a system that will make it possible to rational-

ize and promote the best possible use of the fiscal resources assigned to the Department of Health and its Health Facilities and Services Administration. Some of the strategies include reviewing the procedures for allocating the budget to the health regions; reviewing the legal framework governing the respective health areas; and initiating actions that foster greater administrative autonomy.

Another priority is to create a budget projection system for the fiscal planning of resources. The strategies in this connection call for the establishment of a Fiscal Review Committee that will lay down the base for the system and the assessment of the instruments for financing of health services.

Food and Nutrition. The priority in this area is the prevention of high-risk factors that threaten nutrition, especially those associated with chronic degenerative diseases, by providing preventive services for vulnerable groups. Some of the strategies include reinforcement of the Nutrition Program at the primary level by adding professional staff specialized in diet and nutrition; conduct of an evaluation based on the analysis of data gathered to detect needs; and establishment of projections for the services.

Drinking Water, Sanitation, and Other Environmental Problems that Affect Health. Working strategies include the ongoing monitoring of the Water Supply and Sewerage Authority's 42 surface water systems that have not yet complied with the required filtration in the drinking water treatment process, and sanitary inspection of those systems that violate the prescribed regulations for drinking water, including monthly progress reports. In community systems that rely on underground water sources, the target focuses on getting them to achieve full compliance; in systems that have surface water sources the goal is to have them shift to a subterranean source if possible, and get 100% of them to disinfect their water. Another strategy calls for studies to identify vulnerability to bacteria, pesticides, and volatile organic compounds in the drinking water systems.

Priority Programs and Population Groups. One priority goal is to shore up technical and administrative capabilities in order to deliver optimum services for the prevention and treatment of AIDS. Some of the strategies designed to attain this end include establishment of mechanisms for the analysis, monitoring, and evaluation of education and risk-reduction projects with a view to measuring progress, identifying factors

that may be interfering with effectiveness or efficiency, and assessing the need to continue, refine, reduce, redirect, or expand operations; expansion of installations at the Regional Immunology Centers; identification of community leaders to work on local-level AIDS prevention efforts; and identification of physical and psychosocial needs of HIV-infected children and women of reproductive age and their families.

Another priority is the strengthening of health services, in order to guarantee that the population aged 65 and over will receive regular health care and health maintenance services. Strategies include analyzing resources in those communities that are currently providing specific services for the elderly; coordinating services for this population group with institutions and services such as home care, hospices, social services, day care, and community activity centers for the elderly; and launching education campaigns for health promotion and disease prevention in the population 65 years and older.

A third priority is to improve the delivery and quality of the services offered in mental health centers at the level of primary care centers. The working strategies are as follows: set up the installations needed in order to offer basic mental health services in every mental health center; create positions and recruit the necessary staff in each center; and develop an ongoing system for providing mental health services at the primary level under the Mental Health and Substance Abuse Services Administration.

Health Promotion. A priority goal is to see that the established public policy, which emphasizes prevention and health education and promotion, becomes an integral part of the operations of the Department of Health and its Facilities and Services Administration. The strategies are as follows: preparation, organization, and dissemination of information and educational materials on preventing the most prevalent diseases in Puerto Rico, and design and implementation of educational programs on chronic disease and lifestyles.

Another priority is to formulate mechanisms that will enable the inhabitants to participate actively in self-care and in the maintenance of their health. Some of the strategies include identification of volunteer organizations and the services that they offer; identification of the barriers that impede access to the services provided by the Department of Health; the conduct of a study aimed at introducing flexible or extended hours of service; establishment of satellite or mobile units that offer services in isolated communities; and

creation of a system for the dissemination of health information.

Health Legislation. The priority is to update the legal framework governing the different health areas and to initiate actions leading to legislative and administrative reforms to Puerto Rico's health system. The strategies include establishing, within the Department of Health, an ongoing process for identifying and promoting new legislation and reviewing current laws; implementing mechanisms that will ensure effective representation and communication between the Department of Health and its Health Facilities and Services Administration, as well as with the committees on health in the Senate and House of Representatives; and evaluating new modalities for the provision of health services whereby maximum use is made of the network of health institutions in the public sector, as well as other resources available in both the public and the private sectors.

Organization of Services

Personal Health Care Services

Infrastructure. The Constitution of the Commonwealth of Puerto Rico establishes that health is a right, not a privilege. It also states that people's health deserves and must be the Government's highest priority. The Government has the responsibility of ensuring that the inhabitants of Puerto Rico are provided with health services of the best quality and that there are no barriers that prevent the people from having access to these services, while at the same time guaranteeing them the right to choose freely between services in the public and private sectors. Under the laws of Puerto Rico, the Department of Health is the single official authority entrusted with the planning of health services. Law 101, enacted in 1965 and known as the "Health Facilities Law," stipulates that the Department of Health is the sole public agency responsible for carrying out the law's provisions in the Commonwealth of Puerto Rico.

To fulfill the mandate entrusted to it by law, the Department of Health developed a regional system, first put into effect in 1958. The area selected as the system's pilot was that served by Bayamón District Hospital, which included the San Juan metropolitan area and 16 municipalities. In 1960, the general scheme was expanded, and the island was divided into five regions, each with a population ranging from 350,000 to 900,000. The three levels of care included under this

scheme were the local health centers (primary care), the regional hospitals (secondary and tertiary care), and the specialized level, with services provided by the Río Piedras Medical Center in the San Juan metropolitan area.

In 1970, the system was reorganized and the island was divided into three regions: northeast, south, and west, with a base hospital in each region as part of the medical centers of Río Piedras, Ponce, and Mayagüez. In 1977, the system was once again revamped both geographically and functionally. The new structure, which remains in effect, provides for seven regions (the San Juan Metropolitan Area, Bayamón, Arecibo, Mayagüez, Ponce, Caguas, and Fajardo) and two subregions (Aguadilla, in the Mayagüez region, and Humacao, in the Caguas region), which together have been subdivided into a total of 16 areas.

To ensure the quality, effectiveness, and efficiency of the system, levels of care have been interlinked so that the user can receive whatever attention is needed as promptly as possible and with maximum effectiveness.

The primary level represents the health system's entry point; everyone has direct access to it, and from it persons are referred to higher levels. The services should be accessible to the population and should target the prevention and treatment of diseases that have a high probability of affecting individuals in the course of their lives. The primary level should have adequately equipped emergency and outpatient services for treating diseases, which are to be located in diagnostic and treatment centers, family health centers, and public health centers and units. Emphasis is on promotion and prevention, supplemented by health education and duly combined with curative care and rehabilitation.

At the secondary level, the objective is to solve health problems that occur relatively infrequently and that affect isolated individuals, but which nevertheless have a significant level of prevalence in population groups of 25,000 or more. Emphasis is on early diagnosis, with a view to shortening the course and limiting the seriousness of the diseases encountered. Medical care is intermittent and is provided in response to referral from the primary level, for which it provides support services. Services at the secondary level are headquartered in area and subregional hospitals that have outpatient and inpatient services in the basic specialties that they cover.

The tertiary level concentrates on infrequent diseases, the prevalence of which can only be predicted in populations across several municipalities. This level must be able to offer highly specialized and costly ser-

TABLE 3
Number of hospitals by type, Puerto Rico, 1989–1990.

| Type of hospital | Total | Public | Private |
|------------------|-------|--------|---------|
| Total | 72 | 28 | 44 |
| General | 59 | 21 | 38 |
| Specialized | 5 | 2 | 3 |
| Psychiatric | 7 | 4 | 3 |
| Federal hospital | 1 | 1 | 0 |

TABLE 4
Services delivered at the three levels of care in the public health system, Puerto Rico, 1990–1991.

| Type of service | Number |
|---------------------------|-----------|
| Admissions | 141,496 |
| Emergency room visits | 2,081,858 |
| Deliveries attended | 34,101 |
| Live births | 34,001 |
| Cesarean sections | 7,838 |
| X-rays taken | 1,225,969 |
| Radiographic studies | 173,829 |
| Nuclear medicine studies | 12,051 |
| Tissue specimens examined | 68,167 |
| Electrocardiograms | 203,542 |
| Electroencephalograms | 4,978 |
| Renal dialysis treatment | 15,265 |
| Outpatient clinic visits | 3,106,035 |

vices based on complex technology, highly specialized medical professionals, and sophisticated equipment in order to guarantee the services offered. At the tertiary level, the services correspond to specialized and sub-specialized regional hospitals. Services at the highest level of specialization are offered at the Mayagüez, Ponce, and Río Piedras Medical Centers and the Puerto Rico and Caribbean Cardiovascular Center. Table 3 gives the number of hospitals in Puerto Rico in 1989–1990.

Coverage. In 1989–1990 the general hospitals reported 1,367,591 visits to emergency rooms, for an average of 387 visits per 1,000 population. This figure represented a decline of 12.4% compared to the 1986–1987 figure, which stood at 474 visits per 1,000.

A breakdown by sector shows that both the private and the public sectors experienced decreases in most of the utilization indicators. The bed occupancy rate in the public sector increased slightly, from 62.1% in 1986–1987 to 63.9% in 1989–1990, while the private sector experienced a decrease, from 69.4% to 67.5%.

Table 4 gives selected data on the services provided at the three levels of care by the Puerto Rico health system in 1990–1991.

Available Resources

Human Resources

In 1989–1990 there were approximately 15,994 employees working in all the hospital institutions. Of the 2,514 physicians, 1,769 were in the public sector and 745 in the private sector. There were 4,064 graduate nurses in the public sector and 3,386 in the private sector. Of the 4,668 practical nurses, 2,603 worked in the public sector and 2,065, in the private sector. In 1989–1990 the public sector had 54.5% of the graduate nurses, 55.7% of the practical nurses, and 70.4% of the physicians, while the private sector had 45.2% of the graduate nurses, 44.2% of the practical nurses, and 29.6% of the physicians.

Table 5 shows the number of registered physicians by year of graduation and employment status in the profession during the 1989–1992 period.

Financial Resources

Health services account for an expenditure of US\$ 1,800 million a year, or 12% of the gross domestic product. Of this amount, US\$ 800 million (44.4%) is spent in the public sector and goes to serve approximately 60% of the population, or 2.2 million persons. The remaining 40% of the population pays a total of US\$ 1,000 million a year either for prepaid medical insurance or as direct payment for services received from physicians, hospitals, and laboratories.

In fiscal year 1992–1993, the combined budget of the Department of Health and its Facilities and Services Administration (i.e., the public sector) was US\$ 908,590,740.

Total operating expenses for Puerto Rico's hospital establishments in fiscal year 1989–1990 amounted to US\$ 1,070,483,875. Of this amount, US\$ 449,085,725 was for payroll and US\$ 621,398,150 went for other expenditures. Public sector expenditures came to US\$ 570,171,063, and for the private sector the figure was US\$ 500,312,812.

Physical Resources

In fiscal year 1989–1990, Puerto Rico had 72 hospitals in operation, 59 general, 7 psychiatric, 5 specialized, and 1 federal hospital. Of the general hospitals, 21 were state or municipal and 38 were private.

TABLE 5
Number of physicians registered by graduation year and employment status
in the profession, Puerto Rico, 1989–1992.

| Graduation year | Total registered | | Active in Puerto Rico | | Active outside Puerto Rico | | Inactive | |
|-----------------|------------------|-----|-----------------------|------|----------------------------|------|----------|------|
| | No. | % | No. | % | No. | % | No. | % |
| Total | 7,389 | 100 | 6,269 | 84.4 | 507 | 6.9 | 613 | 8.3 |
| Before 1940 | 32 | 100 | 26 | 81.3 | — | — | 6 | 18.8 |
| 1940–1944 | 92 | 100 | 67 | 72.8 | 3 | 3.3 | 22 | 23.9 |
| 1945–1949 | 121 | 100 | 100 | 82.6 | 6 | 4.9 | 15 | 12.4 |
| 1950–1954 | 265 | 100 | 225 | 84.9 | 16 | 6.0 | 24 | 9.1 |
| 1955–1959 | 507 | 100 | 460 | 90.7 | 21 | 4.1 | 26 | 5.1 |
| 1960–1964 | 571 | 100 | 511 | 89.5 | 41 | 7.2 | 19 | 3.3 |
| 1965–1969 | 489 | 100 | 440 | 89.9 | 38 | 7.8 | 11 | 2.3 |
| 1970–1974 | 729 | 100 | 672 | 92.2 | 47 | 6.5 | 10 | 1.4 |
| 1975–1979 | 1,466 | 100 | 1,319 | 89.9 | 98 | 6.7 | 49 | 3.3 |
| 1980–1984 | 1,957 | 100 | 1,641 | 83.9 | 159 | 8.1 | 157 | 8.0 |
| 1985–1989 | 1,094 | 100 | 776 | 70.9 | 75 | 6.9 | 243 | 22.2 |
| 1990–1992 | 55 | 100 | 24 | 43.6 | 1 | 1.8 | 30 | 54.6 |
| Not specified | 11 | 100 | 8 | 72.7 | 2 | 18.2 | 1 | 9.1 |

Of the 13,676 hospital bed capacity authorized by law, a complement of 10,421 (76.2%) were in use in 1989–1990. Of the total number in use, 48.8% were in the public sector and 51.2% in the private sector. In 1989–1990 the authorized capacity was 3.87 beds per 1,000 population and the actual beds in use were 2.95 per 1,000. Bed turnover in the general hospitals was 48.2 in 1986–1987 and 49.5 in 1989–1990.

In 1989–1990 there were a total of 422,571 reported

admissions to hospital establishments, or 123.9 admissions per 1,000 population. The breakdown by source of payment was health insurance plans, 244,845 (57.9%); medically indigent, 120,390 (28.5%); direct payment, 28,584 (6.8%); and other sources, 28,752 (6.8%).

In 1992, Puerto Rico had 666 clinical laboratories in operation, as well as 52 blood banks, 2 public health laboratories, and 56 histopathology laboratories.

SAINT KITTS AND NEVIS

GENERAL HEALTH SITUATION AND TRENDS

Saint Kitts and Nevis is a twin-island nation that attained independence on 19 September 1989. The islands are located at 17° N and 62° W in the Leeward Islands chain. Saint Kitts (also known as Saint Christopher) is the larger of the two islands, with a surface area of 176.2 km²; Nevis is about 93 km².

The islands of Saint Kitts and Nevis constitute a federal State within the British Commonwealth. The State is governed as a constitutional monarchy and a parliamentary democracy. The head of Government is the Prime Minister, who appoints and heads the Cabinet, which, in turn, is responsible to the Parliament. Nevis has considerable authority over its internal affairs.

The economy traditionally has been based on the growing of sugarcane and the refining of sugar for export, but tourism and light manufacturing recently have begun to represent a larger proportion of the gross domestic product (GDP). Illustrative of this growth in tourism is the number of stay-over arrivals in the country, which increased from 35,476 persons in 1981 to 75,689 in 1989. The number of hotels rose in the same period from 17 to 27.

The GDP increased from US\$ 79.4 million (US\$ 1,814 per capita) in 1986 to US\$ 112.7 million (US\$ 2,688 per capita) in 1989 and US\$ 128.2 million in 1990. Real GDP growth averaged 4% per year during the period 1982–1984. During the second half of the 1980s real GDP growth was almost 7% a year. From 1986 to 1989, the economy grew at an average of 7.5% per year. In 1990 growth slowed to 3.0% (in part as a result of Hurricane Hugo in September 1989), but 1991 again saw increased growth of 6.9%. Retail prices increased by an average of 4% per year during the period 1990–1992.

Health and Living Conditions

Saint Kitts is easily accessible by air, having an airport that can accommodate jet aircraft. Infrastructure can be considered reasonably well developed: the road network, transportation system, and telephone and

electricity networks throughout the island are adequate. The Nevis airport can accommodate smaller aircraft and enjoys regular air service from surrounding islands.

Although the country suffered considerable damage from Hurricane Hugo, improvements in housing conditions in recent years have contributed greatly to the well-being of the population. However, there are a number of serious environmental problems, such as inadequate disposal of solid and liquid waste—especially untreated sewage—into coastal lands and waters, resulting in coastal zone degradation, fish depletion, and health problems (gastroenteritis).

Unemployment was estimated at 20% in 1987; there are no accurate data on underemployment. Nearly all children aged 5–14 years are enrolled in school. In the school year 1989–1990 there were 10,217 students enrolled in the country's 25 primary and 6 secondary schools. The pupil to teacher ratio was 22:1 in primary school (6,196:284) and 14:1 in secondary schools (4,021:281). Illiteracy in the population 15 years and over was estimated at 10% in 1990.

Population

The population of Saint Kitts and Nevis is ethnically mixed, but those of African descent constitute 95% of the population, the remaining 5% being of European, Chinese, and East Indian descent. The latest census was taken in 1991, but its results have not yet been released. The estimated population has been declining in recent years, despite an annual rate of natural increase that fluctuated between 1.08% and 1.25% in the period 1987–1992. The decline in population is probably due to emigration of persons in the age group 25–44 years. The 1980 census recorded a population count of 43,309. The estimated population in 1989 was 41,960.

The population on the islands is still relatively young. Persons younger than 15 years of age made up an estimated 32.6% of the population in 1989 (a decrease from 37.4% in 1980), and those 65 and over constituted 9.8% in the 1989 estimates and 9.6% in 1980. In the age group 15–44 there was a considerable differ-

TABLE 1
Estimated population and percent by age and sex,
Saint Kitts and Nevis, 1989.

| Age group (years) | Total | | Male | | Female | |
|----------------------|--------|-------|--------|------|--------|------|
| | No. | % | No. | % | No. | % |
| All ages | 41,960 | 100.0 | 21,901 | 52.2 | 20,050 | 47.8 |
| 0-4 | 4,740 | 11.3 | 2,470 | 5.9 | 2,270 | 5.4 |
| 5-14 | 8,920 | 21.3 | 4,730 | 11.3 | 4,190 | 10.0 |
| 15-24 | 7,620 | 18.2 | 4,030 | 9.6 | 3,590 | 8.6 |
| 25-34 | 6,190 | 14.8 | 3,760 | 9.0 | 2,430 | 5.8 |
| 35-44 | 4,770 | 11.4 | 2,580 | 6.1 | 2,190 | 5.2 |
| 45-54 | 2,950 | 7.0 | 1,400 | 3.3 | 1,550 | 3.7 |
| 55-64 | 2,650 | 6.3 | 1,270 | 3.0 | 1,380 | 3.3 |
| 65+ | 4,120 | 9.8 | 1,670 | 4.0 | 2,450 | 5.8 |

Source: Ministry of Development, Statistics Division. Annual Digest of Statistics, 1989.

ence between the estimated numbers of males and females in 1989: males made up 24.7% of the population (10,370), while females in the same age group accounted for 19.6% (8,210) (Table 1).

The enrollment in primary and secondary schools in the period 1979-1989 shows a gradual but steady decline, from 12,107 in 1979 to 10,217 in 1989.

The crude birth rate was 23.6 per 1,000 population in 1989 and 1990, and 21.9 in 1991. The crude death rate in these same years was 11.5, 11.1, and 9.5 per 1,000 population, respectively. Total fertility for the period 1985-1990 was 3.0. General fertility rate was 95.0 per 1,000 women 15-44 years old in 1988 (944 live births) and 110.3 in 1989 (989 live births).

Life expectancy at birth increased for males from 65.3 years in 1987 to 66.1 in 1990 and for females 70.8 to 70.6, respectively.

Mortality

Reporting of births and deaths and other vital statistics is generally complete and of satisfactory quality, but heretofore the collection and processing of mortality and morbidity data have been hampered by the lack of qualified personnel. A health information system has recently been established in Saint Kitts, and an information officer appointed, leading to a much improved situation.

Deaths in 1989 were as follows: under 1 year, 22; 1-4 years, 7; 5-14 years, 7; 15-24 years, 6; 25-34 years, 18; 35-44 years, 17; 45-54 years, 26; 55-64 years, 59; and 65 years and over, 318. Age was not stated in 4 deaths out of a total of 484.

TABLE 2
Mortality due to selected groups of causes, Saint Kitts
and Nevis, 1990 and 1991.

| Cause of death | 1990 | | 1991 | |
|---|--------|-------|--------|-------|
| | Number | % | Number | % |
| Total, all causes | 467 | 100.0 | 397 | 100.0 |
| Symptoms, signs and ill-defined conditions (ICD-9, 780-799) | 80 | 17.1 | 59 | 14.9 |
| Total, excluding ill-defined conditions | 387 | 100.0 | 338 | 100.0 |
| Infectious and parasitic diseases (ICD-9, 001-136) | 24 | 6.2 | 10 | 3.0 |
| Diseases of the circulatory system (ICD-9, 390-459) | 158 | 40.8 | 153 | 45.3 |
| Diseases of the respiratory system (ICD-9, 460-519) | 19 | 4.9 | 10 | 3.0 |

Source: Records of the Ministry of Health and Women's Affairs.

The number and percentage of deaths due to several broad cause groups in 1990 and 1991 are shown in Table 2. The proportion of deaths due to "symptoms, signs, and ill-defined conditions" was 17.1% in 1990 and 14.9% in 1991. In 1991 cerebrovascular diseases (ICD-9, 430-438) were the cause of 46 deaths, for a cause-specific rate of 1.09 per 1,000 population. Other important groups of causes of mortality were hypertensive disease (401-405), with 33 deaths (0.78 per 1,000); endocrine and metabolic diseases (240-259, 270-279), with 24 deaths (0.57); ischemic heart disease (410-414), with 23 deaths (0.54); malignant neoplasms of the genitourinary organs (179-189), with 19 deaths (0.45); and nutritional deficiencies (260-269), with 11 deaths (0.26).

The number of deaths from nutritional deficiencies is notable. According to the Ministry of Health most of these deaths were in the age group 65 years and over.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

There were 21 infant deaths in 1987, 23 in 1988, 22 in 1989, 16 in 1990, and 9 in 1991. In the period 1987-1991 the infant mortality rate varied considerably, but this was mainly because of the small number of events. The highest and lowest rates recorded were 27.3 and 16.3 per 1,000 live births in 1990 and 1991, respectively. Neonatal deaths account for a high proportion of in-

fant mortality. In the period 1987–1989, 36 of 66 infant deaths occurred in the neonatal period.

The major cause group of infant mortality in the years 1990 and 1991 was “certain conditions originating in the perinatal period.” Of 42 infant deaths in the 2-year period 1990–1991, 31 were attributed to this group of causes and 4 to congenital anomalies. Of the 13 deaths of 1–4-year-olds in 1990–1991, 3 were attributed to diseases of the urinary system, 2 to intestinal infectious diseases, another 2 to accidents by fire and flames, and 2 more to “other diseases of the respiratory system.”

A problem that has been linked to infant mortality is the late first attendance (after the 20th week of gestation) at an antenatal clinic or lack of any antenatal care.

Morbidity patterns in early childhood, as derived from hospital admissions data, show a proportionately high incidence of gastroenteritis and protein-calorie malnutrition: 17.2% and 13.4% of pediatric admissions to the Joseph N. France Hospital were due to those two causes combined in 1987 and 1988, respectively, thus placing the two causes combined in number two rank on the list of reasons for admission. Respiratory diseases ranked number one, accounting for 28.0% of admissions in 1987 and 29.9% of admissions in 1988. Injuries ranked third, with 11.5% and 7.6% of pediatric admissions in 1987 and 1988, respectively.

The frequency of low birthweight was 11.3% in 1988, 11.1% in 1989, 11.8% in 1990, and 7.9% in 1991.

Health of Women

Teenage pregnancy has long been recognized as a problem in Saint Kitts and Nevis. The average yearly proportion of births to mothers under 20 years of age was 18.7% (715 out of 3,818 births) over the 4-year period 1988–1991. Of the 715 births to these mothers, 16 occurred in girls 10–14 years old and 220 (30.8%) in girls with a parity greater than one.

Workers' Health

No specific data could be traced to assess the health problems of workers. Although the National Insurance Scheme (NIS), which covers all employed persons, does produce statistics on medical insurance benefit payments and industrial injuries, the numbers reported are small and their interpretation remains difficult. From 1986 through 1989 a total of 1,178 claims

were awarded by NIS for injuries. About 80% of industrial injuries were classified as “contusions, abrasions, and cuts,” and the rest was distributed over “fractures” (4%), “sprains and strains” (4%), “burns” (3%), and other unspecified injuries.

Diseases and Health Impairments

Notifiable Diseases

This section describes the reporting of diseases notifiable in Saint Kitts, as reported to the office of the Chief Medical Officer.

The occurrence of viral hepatitis (48 cases in the 3-year period 1990–1992) has led to concern for the safety of health workers.

In 1992 there was an epidemic of hemorrhagic conjunctivitis, with 109 reported cases. No cases had been reported in at least the previous 5 years.

The relatively high number of gastroenteritis cases (3,870 in 1990–1992) underscores the need for improvement in the quality of the water distribution system.

Despite high levels of vaccination coverage, measles cases have been reported every year up to 1992 since at least 1978. In the 6-year period 1978–1983 the total number of cases was 1,916, and epidemics occurred in 1979–1980 and 1982–1983. In the next 6-year period (1984–1989) the total number of reported cases was 96. In 1990, reported cases peaked once again at 80.

Measles vaccination coverage rates were 90% in 1989 and 99% in 1990. For OPV and DPT (third doses), coverage rates were 99% in 1989 and 1990. In 1991, 100% coverage was achieved for OPV, DPT, and measles, among the target population of children under 1 year.

The sudden reemergence of tuberculosis is also noteworthy. No cases were reported from at least 1987 through 1990, then five cases appeared in 1991–1992. The reports do not indicate whether these cases were AIDS-related.

AIDS and Other Sexually Transmitted Diseases

In the period January 1984 to December 1992 there were 37 cases of acquired immunodeficiency syndrome (AIDS) reported in Saint Kitts and Nevis. A western blot-confirmed HIV antibody test is required for the diagnosis, which is based on the WHO/CDC definition or the PAHO modified (Caracas) case definition. Although no seroprevalence studies have been

conducted, testing results are available from groups that serve as sentinel indicators: 713 units of blood tested during the period 1989–1991 yielded no confirmed HIV positives; of 180 prisoners tested, 2 were asymptomatic HIV positives; of 61 antenatal tests, none were positive.

Since 1988, full information on age, sex, and other factors that are of epidemiologic importance in AIDS cases has not been available for analysis.

There were 225 cases of gonorrhoea and 7 cases of syphilis reported in the 3-year period 1990–1992.

Accidents and Violence

In 1991–1992 a total of 12,071 patients were seen for care of all injuries, poisonings, and external causes at the emergency department of the Joseph N. France Hospital. Of these, 560 were admitted and 12 died. During the 4-year period 1987–1990, 2,721 road accidents were reported, resulting in 730 persons injured and 28 persons killed.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

General Socioeconomic Policies

Tourism development and diversification have been increasingly emphasized as the economic policy for future growth. Non-sugarcane agriculture (fruits, root crops, and vegetables) is being stimulated, as well as export-oriented manufacturing.

The Government has accorded high priority to human resource development in its social policy. Human resource development is defined to include health, education, housing, and social and cultural needs. As a consequence of this decision, the expenditure of the health ministry has been increased by EC\$ 924,500 (8.4%) for the fiscal year 1993.

However, the Government also realizes that a developing nation with limited resources will be forced to place some limitations on the provision of health care. Moreover, a population the size of Saint Kitts' cannot sustain a fully equipped hospital with facilities that incorporate all the latest technological medical advances.

Health Policies and Strategies

The Ministry of Health and Women's Affairs drafted a document in 1989 that describes the national aspirations in health and sets forth a number of objectives and strategies to address priority health issues. The document states that the Government believes that the purpose of development is to help people lead economically productive and socially satisfying lives and subscribes to the Alma-Ata Declaration's call to provide health for all by the year 2000. Furthermore, the Government is convinced that the primary health care approach offers a way to attain that objective at a cost which is both acceptable and affordable, and that it should be employed to make health care accessible to individuals and families, with their full participation.

Priority areas include:

- Improving maternal and child health care, including family planning, with particular emphasis on reducing the number of teenage pregnancies;
- Integrating family life education into the school curricula;
- Upgrading the immunization program to maintain 100% coverage;
- Bringing about a major decrease in malnutrition, diarrheal, and respiratory diseases in children;
- Reducing the incidence and prevalence of sexually transmitted diseases;
- Implementing an extensive government program to improve environmental health and safety, with special priority to be given to the provision of safe water and basic sanitation services for all rural and urban populations.

In addition, the Government continues to make free dental services available to schoolchildren throughout the island.

Mental health services have been improved through the training of additional psychiatric nurses. One physician has been trained as a psychiatrist and is now fully qualified. A psychiatric wing has been established at Joseph N. France Hospital.

The Government continues to implement its firm decision to upgrade Joseph N. France General Hospital through the acquisition of new equipment. Specialist services have been expanded through the recruitment of additional professional staff. Furthermore, 13 staff nurse positions have been added. In order to pay for these expanded services, the Government is seriously considering alternative forms of health care financing and the introduction of more effective and appropriate cost recovery mechanisms.

Organization of Services

Responsibility for health resides at the federal level and is entrusted to the health ministry. However, the island of Nevis, through a unique constitutional arrangement, has autonomy over many of its day-to-day operations.

Personal Health Care Services

Saint Kitts has two general hospitals (Joseph N. France General Hospital in Basseterre, with 174 beds, and Pogson Hospital, with 38 beds) and one "cottage" hospital (Mary Charles Hospital in Molineaux, with 10 beds). In addition, the 100-bed Cardin Home and the six-bed Hansens Home provide geriatric care. Nevis has the Alexander Hospital, with 54 beds. There is no private hospital in Saint Kitts and Nevis, but private beds are available in the government hospitals. Patients needing specialized care unavailable in the country are referred to organizations and institutions in the Caribbean region.

The occupancy rate at the Joseph N. France Hospital for 1992 was 64.0%, and the average length of stay was 9.0 days. In that year, there were 4,004 admissions and 2,191 operations performed, as well as 13,696 outpatient consultations and 3,070 visits to the emergency department.

Pogson Hospital had 389 admissions in 1989, with an occupancy rate of only 21.3%; an average length of stay of 9.3 days; 1,977 outpatient visits; and 1,880 emergency department visits.

Primary health care services are offered through a network of 17 health centers, of which 11 are located on Saint Kitts and the remainder, on Nevis. The Community Health Services is the unit responsible for the delivery of primary care. The services offered by that unit include maternal and child health, family planning, dental health, mental health, environmental health, programs for the control of diabetes and hypertension, and home visiting.

In 1992, 52 new patients were registered at the diabetic clinics, adding to a total of 512 registered diabetes patients.

In 1988, 41% of women 15–44 years of age used contraceptives. In 1992, family planning clinics provided services to 5,465 registered clients. Of these, 2,879 (52.7%) received oral contraceptives.

In 1991, there were 2,578 visits to antenatal clinics and 2,204 postnatal home visits.

The child health clinics recorded 24,052 attendances in 1991, and 3,005 school health examinations were performed.

Environmental Services

As the country's economic base shifts from sugar to tourism and nontraditional crops, development and the environment are becoming issues of concern for local decision-makers.

Water pollution has been reported to be a problem in those areas outside Basseterre that are not connected to the water treatment plant at La Guerrite. Water samples frequently are found to be contaminated with coliform bacteria. It is unclear whether gastroenteritis and diarrhea, frequent causes of admission to Joseph N. France Hospital, are associated with water pollution or with other unsanitary conditions.

In the urban environment, 79% of households have water supplied through house connections and the rest have access to a yard tap (1%) or a public standpipe (20%). In rural areas, 70% of households have house connections, 2% have a yard tap, and 20% have access to a public standpipe, while the remaining 8% have no easy access to the public water system. It should be noted that even those rural households with house connections often obtain their water from untreated sources.

Solid waste disposal continues to be the most important environmental problem and most likely will remain so in the near future. A crucial factor is lack of funds to acquire suitable equipment for transporting refuse for disposal and to exercise good sanitary engineering practices at the landfill as well as maintain access roads to the landfill. Questions have been raised within the ministry as to whether the refuse collection service should continue to be provided free of charge.

Sewage and wastewater as well as industrial waste continues to be discharged into public drains designed to convey surface runoff and storm water. These wastes eventually end up in the sea, creating marine pollution. The problem is compounded by the increase in light manufacturing.

In Saint Kitts 55% of households have a water closet, while 35% use pit latrines. Households in rural areas sometimes lack septic tanks or pit latrines, and excreta disposal is a matter of concern there. Moreover, the use of septic tanks in Basseterre is also giving rise to concerns about soil saturation and leakage of effluent into the marine environment.

Data on the *Aedes aegypti* house index are not being collected on a regular basis. The department responsible for vector control also finds its function hampered by a lack of transportation. The latest available mosquito house index was 10.3% in 1991.

Available Resources

Human Resources

Human resources account for a major portion of expenditures on health. As of 1992, available health professionals in selected categories included 39 physicians (9.3 per 10,000 population), 8 dentists (1.9 per 10,000), 260 nurses (62.0 per 10,000), 24 nurse's aides, 14 pharmacists (3.3 per 10,000), 4 nutritionists, 11 laboratory technicians, 6 X-ray technicians, 1 dental hygienist, and 13 dental assistants. There were also 21 veterinarians. Among the 39 physicians were 4 surgeons, 5 obstetricians/gynecologists, 2 pediatricians, 2 ophthalmologists, 2 medical specialists, 1 psychiatrist, 1 pathologist, 1 ear-nose-and-throat specialist, and 1 dermatologist.

Saint Kitts and Nevis does not have a university or medical school, but academic training in the field of health is provided through a subregional arrangement

with the University of the West Indies. Nursing training is available in the country. Entry into the higher professional categories is regulated by the Medical-Nursing Registration and Midwifery Act. The bodies responsible for the licensing and regulation of these professions are the Medical Board, Nursing Council, and Midwifery Board.

Financial Resources

The percentage of the national budget dedicated to health increased from 8.5% in 1991 to 10.1% in the approved 1993 budget. This increase is indicative of the priority given to health. The government expenditure on health in 1993 will amount to EC\$ 11.9 million—on the order of 2.5% of the gross domestic product. A major share of the 1993 budget is allocated to personnel costs (EC\$ 7.9 million or 66.4% of the total health budget).

The major components of personnel costs derive from the Joseph N. France and Pogson hospitals, which account for about 67% of expenditures on personnel. Hospitals (Joseph N. France, Pogson, Mary Charles, not including the Infirmary-Mental Ward) consume at least 54.5% of the health budget, not including the costs of drugs and medical supplies.

SAINT LUCIA

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

Saint Lucia is governed under a constitutional monarchy based on parliamentary democracy. The Government of the United Kingdom is represented in Saint Lucia by the Governor General; the head of the Government is the Prime Minister. The Prime Minister appoints the Cabinet, which has executive functions and is responsible to Parliament. The most recent parliamentary elections took place in 1989 and 1992.

The country is an island that enjoys a tropical marine climate; the rainy season extends from June to November, and a potential hurricane season from July to November. The socioeconomic characteristics of the country (small, open, and largely undiversified) make its economy very vulnerable to external shocks. The economy of Saint Lucia is based on agriculture.

Tourism is the second largest foreign exchange earner. A total of 347,564 tourists (two and a half times its own population) visited Saint Lucia in 1992, of which 47% were cruise ship passengers. Capacity for tourist accommodation has increased significantly (from 1,384 rooms available in 1981 to 2,659 rooms in 1992—a 92% increase). The average hotel occupancy rates ranged between 50% (1981) and 74.5% (1988). Visitor expenditure was estimated at US\$ 207.8 million in 1992, compared to US\$ 32.4 million 10 years ago.

There has been a shift from a predominantly agricultural to a more service-oriented economy. In 1980, 34% of total employment was in agriculture, but that figure decreased to 24.1% in 1991. The service sector accounted for 46.8% of total employment in 1991 (56.1% of female employment and 42.6% of male).

A labor force survey was conducted in Saint Lucia in November 1992. Depending on the definition used, unemployment and underemployment were estimated to range from 16.2% to 22.5% of the total work force in 1991. Although there is a large difference between male and female employment among those 45+ years of age, the gap is becoming narrower in the

younger categories: almost as many women as men are employed in the age group 20–24, probably as a result of the activity of local vocational schools and other secretarial schools. Schooling is compulsory for all children between the ages of 5 and 15 years, and census results since 1946 indicate that school enrollment rates have increased. Approximately 99% of all school-age children at the primary level (32,400) are enrolled in school. The enrollment in secondary schools is 7,238 pupils. In addition, there are 1,264 pupils in secretarial schools and 728 at the Sir Arthur Lewis Community College. Data from the Ministry of Education indicate that more girls than boys are enrolled in the secondary schools (male-to-female ratio around 1:1.3 over the past 7 years).

A literacy survey was conducted in Saint Lucia in 1992, the results of which are not yet published. The latest estimate of the literacy rate was 80%.

Population

According to the last two censuses, the population grew from 113,409 in 1980 to 135,975 in 1991. This increase reflects an annual growth rate of 1.6% for the 1980s—slower than the 1.8% growth rate during the 1970–1980 intercensal period.

The potential labor force (15–64 years) grew between 1960 and 1991 from 50% to 57% of the population, an increase of 31,000 persons. The growth of this cohort has resulted in a lessening of the age dependency ratio from 122 dependents per 100 working-age persons in 1970 to 76 per 100 in 1991. The population structure, by age group and sex, is shown in Table 1. In 1991, life expectancy at birth was around 69 years for males and 74 years for females.

Population density is gradually increasing and in 1991 stood at 221 persons per km². Around 40% of the population lives in Castries (the capital) and its boundaries. Since 1960, districts such as Vieux Fort, Micoud, Dennery, and Gros Islet have been gaining population, while the populations of Soufriere and Anse La Raye have remained stable. Much of the growth can be attributed to internal migration.

TABLE 1
Population by age groups and sex, Saint Lucia, May 1991, census results.

| Age group | Total | | Male | | Female | |
|-----------|---------|-------|--------|------|--------|------|
| | No. | % | No. | % | No. | % |
| Total | 135,975 | 100.0 | 65,934 | 48.5 | 70,041 | 51.5 |
| 0-4 | 15,991 | 11.8 | 7,924 | 5.8 | 8,067 | 5.9 |
| 5-14 | 33,957 | 25.0 | 16,968 | 12.5 | 16,989 | 12.5 |
| 15-24 | 28,262 | 20.8 | 13,932 | 10.2 | 14,330 | 10.5 |
| 25-34 | 20,904 | 15.4 | 9,985 | 7.3 | 10,919 | 8.0 |
| 35-44 | 12,940 | 9.5 | 6,261 | 4.6 | 6,679 | 4.9 |
| 45-54 | 8,564 | 6.3 | 4,093 | 3.0 | 4,471 | 3.3 |
| 55-64 | 6,478 | 4.8 | 2,933 | 2.2 | 3,545 | 2.6 |
| 65 & over | 8,879 | 6.5 | 3,838 | 2.8 | 5,041 | 3.7 |

Completeness of birth registration varies with the source of information: the Government Statistical Unit bases its reports on data from the registrars only, while the Statistics Department of the Ministry of Health collects data from registrars, hospitals, and health centers, providing more accurate though less timely information. The crude birth rate was 27.5 per 1,000 inhabitants in 1991 (3,736 live births). The general fertility rate for the same year was 117.0 per 1,000 women aged 15-44 years.

The 1991 population census recorded 5,529 foreign-born individuals currently living in Saint Lucia. An annual average of 300 foreigners immigrated to Saint Lucia between 1980 and 1991, 64% of whom were from other Caribbean countries.

Mortality

The crude death rate was 6.7 per 1,000 population for 1991, 7.1 for 1990, and 6.6 for 1989. Mortality data are generated from the death certificates completed by doctors and are fairly complete. However, registrars may have difficulty reading a doctor's handwriting, leading to some causes of death not being recorded (5%-10%).

The infant mortality rate was 23.0 per 1,000 live births in 1985 (99 deaths), 12.9 in 1989 (48 deaths), 18.1 in 1990 (67 deaths), and 17.9 in 1991 (67 deaths). The neonatal death rate was 16.3 per 1,000 live births in 1985 (70 deaths) and 13.9 in 1991 (52 deaths). The perinatal mortality rate was 23.5 per 1,000 live births in 1985 (102 deaths) and 29.2 in 1991 (111 deaths). The apparent increase in perinatal mortality might be attributable to better reporting.

The principal causes of death and their percentage contribution to total deaths for the period 1989-1991

were as follows: heart diseases (ICD-9, 393-398 and 410-429), 19%; cerebrovascular diseases (430-438), 13%; neoplasms (140-208), 11%; diabetes mellitus (250), 6.5%; hypertensive diseases (401-405), 6.0%; accidents and adverse effects (E800-E949), 5.1%; conditions originating in the perinatal period (760-779), 4.3%; pneumonia and influenza (480-487), 3.0%; chronic liver disease and cirrhosis (571), 2.1%; and nephritis and nephrosis (580-589), 1.7%.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

The 1991 census counted 15,991 children 0-4 years old, representing 12.0% of the total population.

Low birthweight babies accounted for 7.3% to 9.4% of the live births during the period 1989-1992. During 1992, only 32% of the infants brought to the postnatal clinic at 6 weeks and 22% of the infants presented at child health clinics at 3 months of age were breast-feeding.

In 1985, accidental poisoning and burns were two major types of household accidents among children, with 124 cases hospitalized in the pediatric ward at Victoria Hospital, which represented 7.3% of the department's admissions for the year. The age distribution of the cases was 15.3% under 1 year, 75.8% 1-4 years, 4.8% 5-9 years, and 4.0% 10-12 years.

The leading causes of hospitalization in the 0-4 age group in 1990 were acute respiratory infections (ICD-9, 460-466 and 480-487), which represented 17.0% of all hospitalizations in this age group (20.6% for infants under 1 year); intestinal infectious diseases (001-009),

7.4% (5.9% under 1 year); chronic obstructive pulmonary diseases and allied conditions (490–496), 5.7% (1.7% for under 1 year); infections of the skin and subcutaneous tissue (680–686), 5.6% (4.2% for under 1 year); and accidental poisoning (E850–E869), 4.3% (0.8% for under 1 year). Of the total hospitalizations among the 0–4 age group, 126 (12.8%) were diagnosed only as “symptoms” (780–789); in the under 1 year age group symptoms accounted for 13.2% of all hospitalizations.

With regard to mortality, conditions originating in the perinatal period (760–779) continued as the principal cause of death in children under 5 years, accounting for 51% of all deaths in this age category during the period 1989–1991. It was followed by congenital anomalies (740–759) with 13%, accidents and adverse effects (E800–E949) with 9.4%, intestinal infectious diseases (001–009) with 3.4%, and pneumonia and influenza (480–487) with 2.1%. These five causes accounted for 79% of all deaths in children under 5 years of age.

An increasing number of cases of child abuse are being reported: between 1984 and September 1991, 283 cases were brought to the attention of the division of social services of the Ministry of Social Affairs (86% of these cases were reported in 1989–1991). Of this total, 28% of the claims were linked to sexual abuse, 39% to physical abuse, 25% to neglect, and 7% to abandonment. Data from the STD clinic in Castries indicate that seven girls 1–4 years old were diagnosed with gonorrhea during the period 1991–1992.

Adolescent and Adult Health

In 1991, teenagers represented 23% of the total population in Saint Lucia. The number and the magnitude of problems faced by youth are substantial and include difficulty in obtaining access to secondary education, pregnancies, sexually transmitted diseases including HIV/AIDS, drug abuse, domestic violence, prostitution, traffic accidents, and unemployment.

Although the Ministry of Education is the largest consumer of the national budget (17%–22% over the past 10 years) and significant efforts are being made to better prepare young people for the job market (two new secondary schools opened in 1992), advances continued to be hampered by the rapid growth of the school-age population and lack of adequate funds.

Unemployment among youth has been high and evidence suggests that the rate will increase further.

By age 19, 75% of teenagers are sexually active (around 40% of them before the age of 16), thereby

running the risk of acquiring an STD. For 1991–1992 the number of reported cases of syphilis, gonorrhea, and other STDs were 6 (all females), 12 (11 females), and 108 (77 females), respectively, in the age group 5–14 years; 64 (51 females), 35 (6 females), and 242 (190 females) among those 15–19 years of age; and 106 (80 females), 25 (6 females), and 713 (565 females) among those 20–24 years of age. Of 93 persons identified as HIV positive between 1985 and March 1993, 9 were teenagers infected through sexual intercourse.

Live births to teenage mothers accounted for 24.2% of all live births in 1986 and 20.2% in 1992. Girls who become pregnant are forced to leave the school system. In 1991, 32 females aged 15–19 had already had five children each.

Child abuse, domestic violence, and prostitution beginning at a young age are other growing concerns, as shown by data from the Upton Garden Girls Center and the Saint Lucia Boys Training Center, institutions serving underprivileged youth who are delinquent or in need of care. Of the admissions of 170 girls aged 12–15 during the period 1984–1991, 33% were due to child abuse, 23% to sexual abuse/incest, 13% to domestic violence, 12% to prostitution, 9% to alcohol and drug abuse, and 4% to teenage pregnancy. Of the 177 boys aged 12–16 admitted to the boys institution from 1980 to 1990, 27% were placed there for care and protection and 73% because of criminal offenses, of which 52% were larceny/stealing, 10% indecent assault, 9% housebreaking, 8% wounding, and the rest were causes such as possession of drugs or a weapon.

Sixty-eight percent of the persons admitted to Turning Point Drug and Alcohol Detoxification and Rehabilitation Center in 1992 were 25–34 years old. Most were single and unemployed.

If conditions related to pregnancy and delivery are excluded, traffic accidents represent the principal cause of hospitalization in the 15–44 age category (70 admissions at Victoria Hospital in 1990). In addition, traffic accidents account for 22% of the deaths among 10–29-year-old males, having caused a total of 79 deaths during the period 1981–1991.

Health of Women

Contraceptive prevalence surveys conducted in 1980–1981 and in 1988 suggest that the use of contraceptives by women of childbearing age who are in a union increased slightly, from 52.2% to 54.8%.

Eleven maternal deaths occurred during the period 1980–1991. Since abortion is illegal in Saint Lucia,

available data are limited: between 1979 and 1991, two maternal deaths from abortion complications were reported, one in 1979 and one in 1991. Pregnancy with abortive outcome (630–639) represented 237 discharged inpatients at Victoria Hospital in 1990.

Domestic violence is a growing concern. The Crisis Center, a nongovernmental organization primarily aimed at addressing the immediate needs of victims of domestic violence, rape, other sex-related offenses, and gender discrimination, provides support to victims and their families. Since it opened in October 1988, the number of clients seeking assistance has risen steadily from 5 in 1988 to 198 in 1990, 307 in 1991, and 385 in 1992. Most cases are spouse abuse (55% in 1991 and 45% in 1992).

In 1992, 2,338 women were diagnosed with an STD at one of the three STD clinics. This figure represents approximately 70% of the new clients of the service.

Between 1986 and 1990, mortality from cervical cancer represented 6.5% of all mortality due to malignant tumors and 11.2% of female mortality due to cancer. A more detailed analysis is given in the section on tumors.

Health of the Elderly

In 1990 the leading causes of hospitalization among persons 65 years and over were as follows: 68 patients hospitalized for hypertensive diseases (ICD-9, 401–405), 64 for diabetes mellitus (250), 59 for other forms of heart disease (420–429), 56 for disorders of the eye and adnexa (360–378), 46 for cerebrovascular diseases (430–438), and 46 for malignant neoplasms (150–208). These six causes accounted for 44.1% of all

hospitalizations in this age group at Victoria Hospital in 1990.

Around 55% of the residents at the Senior Citizens Home of Malgretout (Soufriere) require medical attention as a result of blindness, stroke, high blood pressure, or diabetes.

Workers' Health

Limited data are available. A few work-related deaths are reported each year, the most recent ones involving an electrocution, a fall from a building, and a landslide in a trench. An Occupational Health and Safety Department was officially established in 1992 under the Department of Labor.

Health of Special Groups

Disabled. The census performed in May 1991 included, for the first time, a question aimed at assessing the level of potential disability. The results provided an estimate of the prevalence of disabilities at a national level (Table 2).

Migrants. Data related to population mobility are difficult to obtain. According to the census in 1991, approximately 2,075 individuals (equally divided between the sexes) had gone to live abroad in the previous year; 62% of them were in the age group 20–44 years. Serosurveys conducted in 1989–1990 among migrant farm workers traveling to the United States revealed a 1% HIV seropositivity rate. No particular health problem was generated by immigra-

TABLE 2
Disabilities by category and sex, Saint Lucia, May 1991.

| Category | Sex | | Total | | Rate per 100,000 population |
|----------------------|-------|--------|--------|-------|-----------------------------|
| | Male | Female | Number | % | |
| Total | 3,945 | 5,504 | 9,449 | 100.0 | 6,949 |
| Sight | 856 | 1,420 | 2,276 | 24.1 | 1,674 |
| Hearing | 269 | 336 | 605 | 6.4 | 445 |
| Speech | 237 | 215 | 452 | 4.8 | 332 |
| Upper limb (arm) | 394 | 594 | 988 | 10.5 | 727 |
| Lower limb (legs) | 1,140 | 1,718 | 2,858 | 30.2 | 2,102 |
| Neck and spine | 274 | 319 | 593 | 6.3 | 436 |
| Slowness at learning | 204 | 189 | 393 | 4.2 | 289 |
| Mental retardation | 357 | 335 | 692 | 7.3 | 509 |
| Other | 214 | 378 | 592 | 6.3 | 435 |

Source: Population and Housing Census, 12 May 1991.

tion, with the exception of a few imported cases of malaria.

Diseases and Health Impairments

Vector-borne Diseases

A few cases of imported malaria have been reported among foreigners or nationals who traveled to infected areas.

Since 1986 one to four cases of dengue have been reported each year. House indices for *Aedes* range from 6.5% to 3.2%; drums used for storage of domestic water account for over 50% of the breeding containers, while vases and old tires contribute an additional 33%.

With regard to schistosomiasis surveillance, since the closing of the Research and Control Department in 1981 one outbreak has been noted. It occurred in 1987 and caused 107 cases. Arising from this outbreak, 1 to 10 cases have been reported each year, but underreporting is suspected. A malacological survey was carried out in Saint Lucia in May 1992 by assessing the number of *Biomphalaria glabrata* collected per hour of sampling in different types of habitats that harbored this species in the past. No infected snails have been detected to date; in certain areas, competitor snail populations outstrip vector populations by 5:1.

Vaccine-preventable Diseases

No cases of poliomyelitis have been reported in Saint Lucia since 1973. The surveillance of acute flaccid paralysis was strengthened in 1992, as was measles surveillance. Diphtheria was last seen in 1979 when one case was reported; an outbreak of six cases had been noted in 1977. No cases of whooping cough were reported in the period 1987–1992; the last epidemic (471 cases) took place in 1981. There were no reported cases of tetanus, including neonatal tetanus, for the period 1989 to 1992, the most recent case of tetanus having been reported in 1988.

Annual reported cases of measles ranged from 4 to 18 during the period 1987–1992; the last epidemic was in 1982 and affected 2,037 susceptibles. Surveillance for rash-like illness was intensified in 1991–1992. The number of reporting sites increased from 18 in 1991 to 36 in 1992 (33 health centers, one general hospital, two private practitioners). Of the 37 suspected measles cases in 1992, 18 were confirmed and all of them were

lost to follow-up. In the investigation process, two cases of dengue fever and three cases of rubella were diagnosed by the laboratory.

An outbreak of mumps causing 1,076 cases was noted in 1983–1984, and another one in 1988 resulted in 347 cases. Out of these epidemics, some 11 to 39 cases per year were reported between 1989 and 1992, more than 60% of them in children under 5 years old.

Reporting of rubella (German measles) began in Saint Lucia in 1981. Since then, six cases have been noted: two in 1983, one in 1984, and three in 1992. A major outbreak of congenital rubella syndrome took place in 1983.

Cholera and Other Intestinal Infectious Diseases

Shigellosis was not listed as a notifiable disease but instead was included under the general heading of "Dysentery" until the end of 1990. In 1992, a new sub-heading, "Dysentery (bacillary)," was added to the list: five shigellosis cases were reported in 1991 and 16 in 1992. Underreporting is suspected.

A typhoid fever outbreak occurred in 1986–1987, with 83 cases reported. This epidemic was confined primarily to the Dennery area. No cases of cholera have been reported in Saint Lucia, but an intensive educational program was conducted and a plan of action was developed to prepare for a potential outbreak.

Chronic Communicable Diseases

The incidence of tuberculosis was 2.4 per 10,000 inhabitants in 1992 (N=33) and has been about stable since 1986. This disease mainly affects people in the older age groups in Saint Lucia and very rarely children under 5 years of age.

With regard to leprosy, 54 new cases were registered from 1989 to 1992; 55.6% are males, 59.3% are multi-bacillary cases, and 9.3% are under 15 years of age. The total number of patients registered for chemotherapy, surveillance, or care ranged from 40 to 55 during the same period.

Respiratory Diseases

Morbidity data are generated at the hospital level, where 5.4% of all discharges were cases of respiratory diseases. Acute respiratory infections (ICD-9, 460–466, 480–487) and chronic obstructive pulmonary disease

(490–496) are the most common, accounting for 57.7% and 25.1% of all respiratory diseases. Pneumonia and influenza represented the eighth ranking cause of death, claiming 81 lives during the 3-year period 1989–1991.

Zoonoses

Leptospirosis is a growing concern. During the first 3 months of 1993, three cases were reported (one lethal), and in 1992 one death resulted from among four cases. The veterinary division of the Ministry of Agriculture is currently involved in surveillance of this zoonosis among cattle, sheep, and goats by means of serosurveys; it has been informed of the cases so that it may participate in a joint investigation. Rabies is not present on the island and all efforts are being made to avoid its importation.

AIDS and Other Sexually Transmitted Diseases

The first AIDS case was identified in Saint Lucia in 1985; by 31 December 1992 a cumulative total of 86 HIV-infected individuals had been identified, of whom 39 had already died. Out of these 86 HIV-positive persons, 41 had developed full-blown AIDS. Males make up 54.7% of the HIV-positive group. Heterosexual transmission accounts for at least 73% of the total. No case was attributable to transmission through

blood, since early measures were taken to ensure blood bank safety (all blood donations have been tested for HIV since 1985, for hepatitis B surface antigen since 1988, and for HTLV-1 since 1989).

Persons in the economically active reproductive age group, particularly those between the ages of 20 and 44, have been most affected (83%). Three cases were attributable to perinatal transmission.

Based on the results of 5,167 tests for HIV antibody performed between 1985 and December 1992, the HIV prevalence in the country has been estimated at approximately 0.63% of the total population.

Sexually transmitted diseases are fairly common (see Table 3). Data are primarily furnished by the STD clinics established since 1987 in response to the AIDS epidemic. Since 70% of the cases treated at the STD clinic level are in females, there is a need to explore where the males are seeking treatment (private sector, self-medication, or pharmacies).

Steady and significant declines in the number of reported cases of syphilis and gonorrhoea were noted between 1984 and 1990 (from 395 to 266 and from 122 to 84, respectively). A reverse in this trend in 1991 suggests that the declines may have been partly due to underreporting.

In 1992, the percentage of positive VDRL tests among antenatal women was 4.5%.

A study of STD patients and antenatal women conducted in 1990 in four Eastern Caribbean islands, including Saint Lucia, suggested a high prevalence of chlamydia infection—in the range of 12.3% to 13.2%—

TABLE 3
Cases of sexually transmitted diseases diagnosed at STD clinics,
Saint Lucia, 1991–1992.

| Diagnosis | Number of cases | | | % |
|--|-----------------|-------|-------|-------|
| | 1991 | 1992 | Total | |
| Total new STD cases diagnosed | 2,127 | 2,338 | 4,465 | 100.0 |
| HIV infection | 9 | 6 | 15 | 0.3 |
| Syphilis (all cases) | 395 | 266 | 661 | 14.8 |
| Gonorrhoea (all cases) | 122 | 84 | 206 | 4.6 |
| Penicillinase-producing <i>Neisseria gonorrhoeae</i> | 6 | 2 | 8 | 0.2 |
| Nongonococcal urethritis (NGU) | 41 | 48 | 89 | 2.0 |
| Pelvic inflammatory disease (PID) | 53 | 90 | 143 | 3.2 |
| Trichomoniasis | 186 | 232 | 418 | 9.4 |
| Yeast | 353 | 496 | 849 | 19.0 |
| Chancroid | 3 | 1 | 4 | 0.1 |
| Genital herpes | 19 | 20 | 39 | 0.9 |
| Genital warts | 23 | 14 | 37 | 0.8 |
| Cervical cancer | 1 | 0 | 1 | 0.0 |
| Others | 916 | 1,079 | 1,995 | 44.7 |

Source: Annual reports of STD clinics.

while the infection rate for gonorrhea was about one-third lower. A similar study conducted in Saint Lucia in 1992 showed a much lower chlamydia infection rate.

Available data on hepatitis B and HTLV-1 are generated by the blood bank. The number of blood units tested was 1,373 in 1990, 1,176 in 1991, and 1,310 in 1992. Seropositivity rates for HbsAg were 3.5%, 3.1%, and 1.2%; for HTLV-1 they were 2.5%, 1.5%, and 1.2% in the same years, respectively.

Nutritional and Metabolic Diseases and Deficiencies

No statistics are readily available with regard to nutritional status.

Of the 1,801 new antenatal clients registered by the Community Nursing Service in 1992, 15 (0.8%) had hemoglobin levels below 8 g/dl and 91 (5%) had hemoglobin between 8 and 10 g/dl. These percentages, however, may underestimate the prevalence of anemia, since the test is not free and some women may not come in for testing.

In 1992, the Community Nursing Service identified 212 new cases of diabetes, 44% of which were in the Castries area. Information on the prevalence of non-insulin-dependent diabetes mellitus (NIDDM) and breakdown by age group are not readily available. Between 1989 and 1991, mortality associated with diabetes mellitus represented 177 deaths (6.5% of total deaths), making diabetes the fourth leading cause of death.

Cardiovascular Diseases

For many years cardiovascular diseases have been the leading cause of death in Saint Lucia, accounting for 16%–21% of total deaths between 1981 and 1991. In 1986–1987 ischemic heart diseases were responsible for only 5% of the cardiac-related deaths.

Morbidity data furnished by the recently created Cardiology Unit at Victoria Hospital suggest an extremely high frequency of acute rheumatic heart disease and its complications and a relative scarcity of ischemic heart diseases. The apparent lack of correlation between the high prevalence of hypertension and diabetes and the low frequency of ischemic heart diseases is probably due to the rarity of two other major risk factors—dyslipidemias and smoking.

In 1992, 158 new cases of hypertension were reported by the Community Nursing Service.

Malignant Neoplasms

At present (1993) there is no cancer registry in Saint Lucia. According to a retrospective study aimed at estimating the incidence of cervical cancer and the evolution of diagnostic and therapeutic methods in Saint Lucia, 122 uterine cervical cancers were diagnosed from 1986 to September 1991 (incidence rate 15.6 per 100,000 population). Mean age of diagnosis was 49 ± 15.1 years, and cases ranged from 27 to 86 years of age. Carcinoma in situ was treated in Saint Lucia with conization and/or hysterectomy. Invasive cancer was treated with surgery and radiotherapy abroad.

In 1992 a total of 132 cancers were diagnosed at the cytology and histopathology department of the government laboratories. These tumors originated in the cervix (26%), breast (17%), skin (13%), stomach (9%), prostate (8%), intestine (4%), liver (3%), and bladder (2%). Fourteen percent were discovered at a metastatic stage.

Malignant neoplasms ranked third among the principal causes of death in 1989–1991.

Accidents and Violence

Vehicular traffic has increased to alarming proportions in Saint Lucia. The number of vehicles registered has risen steadily from 13,718 in 1989 to 17,715 in 1991. Between 1988 and 1991, the total number of road accidents increased from 1,098 to 1,513, mainly because of a rise in the number of minor accidents. The number of deaths due to transport accidents (E800–E848) remained basically stable during the period 1981–1991, with an annual average of 21 deaths and a 4.4:1 male-to-female ratio; 42.9% of the deaths from this cause are in the age group 20–44 years.

The rates of homicide (E960–E969) per 100,000 population fluctuated between 2.3 and 10.4 during the period 1987–1991 (range of 3 to 14 homicides per year). Suicide (E950–E959) was responsible for 61 deaths (48 men, 13 women), while drowning (E910) claimed 69 lives (59 men, 10 women) during the entire period 1981–1991.

Behavioral Disorders

The extent of the smoking problem in Saint Lucia has not been quantified.

According to the Crime Department of the Royal Saint Lucia Police Force, 266 persons were convicted of

statutory offenses involving dangerous drugs in 1991, compared to 140 in 1987.

In 1992, 85% of the 107 patients admitted to Turning Point Drug and Alcohol Detoxification and Rehabilitation Center (which opened in August 1988) were 15–39 years old and 88% were male.

Several governmental and nongovernmental organizations are actively involved in the fight against substance abuse in Saint Lucia. However, social acceptance of alcohol consumption remains high.

Mental Disorders

Data were furnished by Golden Hope Hospital, where 798, 790, and 982 patients were admitted in 1988, 1989, and 1990, respectively. Among them, 106, 100, and 117 were new cases. Of the new cases, 65% were males, and the most frequent diagnoses were acute psychosis (18.9%) and schizophrenia (14.2%).

Other Diseases

A cord blood screening program was initiated in April 1990. Testing is done on cord blood from any newborn delivered at Victoria Hospital. Out of 3,917 tests performed from April 1990 to September 1992, sickle cell trait was found in 6.3%, sickle cell disease in 1.0%, Hb C trait in 1.8%, and Hb C disease in 0.5%.

Risk Factors

Risks in the Physical Environment

The demand for drinking water has increased substantially. Frequent water shortages in many areas have led to serious inconveniences as well as outbreaks of waterborne diseases. This recurrent problem may be responsible for poor hygiene practices.

A survey conducted in 1991 to assess the operational status of wastewater treatment plants in the Caribbean revealed that 15% of 13 treatment plants in hotels and institutions in Saint Lucia operated poorly and 38% were not operational at all. This may have serious implications when effluent is discharged into recreational areas.

A study of industrial wastewaters in CARICOM countries points out that most manufacturers in Saint Lucia fall far short of acceptable standards.

The problem of poor solid waste management, with its attendant risks, is reaching severe proportions in certain highly populated urban areas.

Natural Disasters

Because of its volcanic origin, there is the potential for a volcanic eruption on Saint Lucia. Between 17 and 19 July 1990 five earthquakes, ranging in intensity from 2.6 to 5.8 on the Richter scale, were recorded, mostly affecting the Soufriere area. Landslides also create serious inconveniences: a landslide at Mon Dudon in 1990 and another one at Bocage in November 1992 damaged property. Tropical storms represent an annual threat to the banana industry.

Housing

According to the results of a recent census, the average number of persons per household decreased slightly between 1980 and 1991, from 4.57 to 4.03.

The quality of houses has improved. However, 11% of all households had no toilet facilities in 1991, and in some districts the situation was more critical: Canaries, 41%; Dennery, 26%; and Anse La Raye, 21%. In 1991, 73% of the households were equipped with electricity compared to 45% in 1980. The second leading source of lighting is kerosene.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

National Health Policy

The main objective is to maintain and upgrade the present and future supply of human resources.

The Government will continue its efforts to improve the health care system by expanding primary health care while simultaneously increasing the availability and quality of secondary and tertiary (including rehabilitative) services.

The Government wishes to improve interministerial coordination, and also strengthen cooperation and optimize consultation with private sector organizations and/or social groups.

The Government will continue to emphasize the need for and acquisition of cost-effective, appropriate technology, medical supplies, and drugs.

In the area of human resources, the Government will continue its efforts to recruit, develop, and retain a cadre of highly trained, committed, and motivated professional, administrative, and technical staff.

The Government will pursue a policy designed to control the growth of the country's population.

In the provision of health services, the Government gives priority to specific vulnerable and at-risk groups, such as the poor, children, expectant and nursing mothers, the elderly, the chronically ill, disabled persons, and people infected with communicable diseases.

The Government of Saint Lucia became a signatory to the UN Convention on the Elimination of All Forms of Discrimination Against Women in 1983. In 1991 a national policy statement on women, prepared by the Women's Affairs Division of the Ministry of Community Development, was approved by the Cabinet, together with a 5-year plan of action.

The National Council of the Disabled has prepared a draft policy statement addressing a number of issues, including accessibility of care, safety, abuse of disabled women, job training opportunities, housing, plans for new buildings, and others.

The Public Health Act was revised in 1993 in order to empower the Public Health Board. Some of the most recent amendments include the following: Public Health (Notifiable and Communicable Diseases) Regulations of 1978, amended in 1991 to add AIDS and HIV infection to the list of notifiable diseases; Family Nurse Practitioners (FNP) Act of 1993, authorizing the FNP to prescribe certain drugs; and Litter Act of 1993, Hospital Regulations, and Statutory Instruments of 1992 (No. 68), amended to introduce the new fee structure.

Organization of Services

Personal Health Care Services

Infrastructure. The Ministry of Health and Local Government is vested with nearly all responsibility for the allocation of health resources and provision of services. It is organized into subdivisions concerned with the various programs, such as health education, maternal and child health, environmental health, laboratories and hospitals, and other curative services. Other governmental agencies that also are involved with part of the health system include the ministries in charge of education; planning; community development; and tourism, mobilization, and utilities.

Outside the Government, many agencies and associations contribute to the national health system. Some (for example, the Cancer Society and the Sickle Cell Association) are concerned with tackling specific diseases. The Nurses' Association, Medical Association, and Public Health Association enforce ethical codes and standards of qualification for health personnel. Private sector health services are relatively small in comparison with the public sector; however, approximately 20% of the population seeking health care patronizes private services every year.

First-level care is provided in the community by environmental health officers, community health aides, and nursing personnel. Second-level care is provided at health centers by community health nurses, family nurse practitioners, and their staff. Third-level care is provided by two district hospitals in Dennery and Soufriere. Fourth-level care takes place in two general hospitals (Victoria and St. Jude) and specialty hospitals such as Golden Hope Mental Hospital and Turning Point Drug and Alcohol Detoxification and Rehabilitation Center.

A new cost recovery system was introduced in 1992, and discussions are taking place with the National Insurance Scheme with regard to sickness benefits, which in early 1993 were offered by around 1,300 employers and covered approximately 30,000 employees.

Coverage. *Hospital admissions and discharges.* Discharges at Victoria Hospital were 7,831 for 1992; average length of stay was 5.6 days and the occupancy rate was 75%. For St. Jude General Hospital these indicators were 4,502 discharges, 4.2 days, and 43%. There were 702 admissions to Soufriere district hospital, which had an occupancy rate of 23%; no data are available for Dennery district hospital.

Outpatient consultations. A total of 7,917 outpatients and 30,083 emergency room patients were seen at Victoria Hospital in 1992.

Laboratory services. Since 1989 the number of tests ordered appears to have stabilized at about 100,000 per annum. The range of testing increased to include hormone assays and cancer marker tests in 1992.

A computer network was put in place in 1993 in the blood bank and serology unit, and it is anticipated that within the next 3 years the entire laboratory will be computerized. Regarding the blood bank, during the period 1988–1989 there were approximately 600 blood donors annually. That number has now more than doubled, reaching 1,294 in 1992.

Diagnostic imaging was upgraded in 1992 to provide new services: fluoroscopy, myelography, mammography, and ultrasonography. The new services

made it possible to perform a variety of invasive procedures on patients who previously would have been sent overseas for these investigations. However, chronic shortage of supplies limited the volume of work that could be done. In 1992, 9,362 radiological exams were performed on 5,152 patients. Radiation therapy is not performed locally.

Physiotherapy treatments represented 7,262 interventions at Victoria Hospital in 1992 (2,948 patients concerned).

Antenatal, delivery, and puerperal care. During 1992, 1,779 antenatal clinics were held, serving 1,801 new clients out of a total attendance of 10,884; thus, antenatal care coverage provided by the Community Nursing Service was 47%. Most other pregnant women seek antenatal care from the private sector.

Almost all (92.7%) of the deliveries took place in the two general hospitals in 1992. An additional 5.8% and 0.6% occurred in the district hospitals and health centers. At Victoria Hospital, 6.4% of deliveries were by cesarean section.

The coverage of women seen 6 weeks postnatally has improved slightly. In 1990 and 1991, 44% of all women who delivered babies utilized the postnatal services provided by the Community Nursing Service. Mothers visiting within the first 10 days after delivery amounted to 19% of all deliveries in 1990 and 24% in 1991.

Growth and development. Although growth monitoring continues at all health centers, incomplete documentation of measurements makes analysis of the data difficult. In 1992, 1,783 child health clinics were held, 2,295 new infants were examined, and total attendance was 22,849. This represents a public sector coverage of 61%.

Immunizations. Immunization coverage has been maintained at a constant high level over the past decade. In 1992, coverage by type of vaccine among children under 1 year of age was as follows: completed OPV, 94%; completed DPT, 94%; BCG, 98%; and MMR, 72%.

Family planning. Family planning services are offered through the Community Nursing Service and its network of 36 health centers, which receive contraceptive supplies from the Caribbean Family Planning Association (CFPA) and the Saint Lucia Planned Parenthood Association (SLPPA). Numerous linkages exist between the public sector and the NGOs in the areas of training, health education, and sharing of information and materials, as well as in planning and implementing interventions.

The SLPPA works out of its medical clinic in Castries and also has a full program of outside activities

that provide information and guidance to the public. It distributes condoms islandwide through community-based distribution outlets. In 1990 only 7% of contraceptive acceptors at SLPPA were teenagers, compared to 19.3% in 1991–1992. The IUD, which accounted for 4% of contraceptive use in 1990, was the method chosen by 9% of the new users in 1991–1992. The most common method used in 1991–1992 was the oral contraceptive (68% of new acceptors). In the public sector, 1,109 new clients visited the service and there were 884 new acceptors during 1992.

Food aid program. Responsibility for this program, which was initially under the Health Ministry, was transferred to the Ministry of Education in 1990. Food is now being provided to children in schools.

Dental services. Dental services are offered islandwide through seven public clinics.

Psychiatric care. Inpatient and outpatient care is provided at Golden Hope Hospital, which experienced several problems in 1992: shortage of beds, shortage of staff, and damage to its physical structure. Equipment for performing electroconvulsive therapy was acquired. Outpatient sessions are held in eight clinics islandwide, and approximately 200 patients are assessed every month at that level. After discharge, Golden Hope patients who are on prescribed medication are followed at the community level through district clinics.

Services for the disabled. The Community Nursing Service offers support and medical attention to the disabled through a community-based rehabilitation (CBR) program that includes home visits (2,192 visits during 1992). Thirty-six new cases of disability were reported during that period.

Several nongovernmental organizations are involved in care of the disabled. The Saint Lucia Association for Retarded Children sponsors the Dunnottar School, which provides education, treatment, and rehabilitation for special children and children with learning disabilities; 67 students 7–40 years old attend the school, which also includes a vocational unit. The Saint Lucia Society for the Deaf operates a school which has an enrollment of 45 deaf and hard-of-hearing children 3–17 years old. It offers an ongoing sign language program targeting parents and family members and has designed a manual for their use. The school works jointly with the hearing health care unit of the Entrepot Health Center, and community health aides are playing a major role in identifying and referring suspected cases at the community level. The Saint Lucia Blind Welfare Association operates and maintains a workshop for the blind (craft production), provides education and recreation for blind persons (audio library), and promotes eye care programs for

sight conservation (development of a National Plan for Prevention of Blindness in 1992). The association facilitated the integration of 36 visually impaired children into the regular school system and proposed modifications to deal with gaps in the existing curriculum.

A school for children with special needs was opened in Vieux Fort in 1991 and is run by the Ministry of Education.

Other specific actions. For early detection of tumors of the reproductive system in women, 6,504 Pap smears were examined during 1992, of which 1.4% proved to be positive. Of this total, 1,480 were done by the Saint Lucia Cancer Society through its Early Detection Clinics (200 clinics held in 1992) and 3,179 were provided by the Community Nursing Service to women attending postnatal clinics (N=1,214) and other sexually active women (N=1,965).

In addition to this cervical cancer screening program, other services offered by the Saint Lucia Cancer Society include training in breast self-examination, counseling, rehabilitation, coordination of visits by oncologists from Martinique, and revolving funds for overseas treatment of cancer patients. Strong emphasis is put on school and community education programs.

The Saint Lucia Sickle Cell Association provides patient care, offers counseling to patients and families, and provides education to the public at large.

The numerous social problems are partially addressed by the Ministry of Social Affairs and Community Development through the Decentralization Program, Community Development Program, Social Services, Women's Affairs Division, institutions for underprivileged youth, youth and sports services, skills training program, and drug abuse prevention program. In addition, several nongovernmental organizations are strongly committed to fighting health-related social problems: the Saint Lucia Child Advocacy Committee (SLCAC), in collaboration with the Saint Lucia Save the Children Fund (LUSAVE); the Saint Lucia Crisis Center; and the Saint Lucia Legal Aid Services.

The nongovernmental organizations have taken the lead in developing programs geared toward the elderly. In 1992 the Saint Lucia Blind Welfare Association started a project in conjunction with HELPAGE International, aimed at providing therapeutic and social support activities for the elderly (including the blind and visually impaired) in the communities, as well as encouraging public awareness through specific international eye care activities, such as establishment of "Club of the 60s."

Care of the elderly is provided in community-based day-care at the community level. However, the num-

ber of older persons seeking admission to seven senior citizens homes is rising. Six of these are run by NGOs and one by the Government.

Golden Hope, the mental hospital, is often used as a shelter for the elderly, who occupy 7% of the beds.

In addition, approximately 80% of the 2,245 recipients of the allowance provided by the Social Welfare Department within the Ministry of Social Affairs and Community Development in 1993 are elderly people.

To address the risks associated with natural disasters, a disaster preparedness office has been established. It is staffed by a national disaster coordinator and one secretary. Plans of action are being developed in each of the 10 districts, and simulation exercises involving various sectors are organized regularly.

To address the health component of disaster preparedness, the Ministry of Health and Local Government has prepared a "Policy on Health Institution Involvement in Emergency and Disaster Management." A health disaster coordinator is based at the Ministry, and a project for the Caribbean region has just started.

The Saint Lucia Red Cross, a local NGO, is involved in first-aid training and assisting victims of disasters.

Environmental Services

Infrastructure. The provision of drinking water and public sewer services is the responsibility of the Saint Lucia Water and Sewerage Authority (WASA). These services were previously under the Health Ministry, but in 1992 they were transferred to the Ministry of Tourism, Mobilization, and Utilities.

Responsibility for solid waste management belongs to the Councils of Local Government. This service was previously associated with the Ministry of Community Development and became part of the Ministry of Health and Local Government in 1992. The service is therefore decentralized.

The Environmental Health Branch of the health ministry offers a variety of services: food quality control, vector control, a schistosomiasis program, general sanitation, school sanitation, community health education, water quality control, wastewater disposal (including maintenance of 64 public facilities), and solid waste management. The role of the department in solid waste management is essentially to act as a monitor, although it has had some limited involvement in collection, particularly as part of clean-up campaigns organized by some communities.

Private rodent control companies function independently, particularly with commercial establishments.

There is no real link between the public and the private sectors in this activity.

Saint Lucia is the headquarters of the Caribbean Environmental Health Institute (CEHI), which is involved in several monitoring projects.

Services. *Drinking water and sewerage services.* Between 1982 and 1991 there was a steady increase in both water production (30%) and consumption (50%) in Saint Lucia. New connections ranged from 1,400 to 2,700 annually between 1985 and 1991. However, the quality of services is far from perfect; failure to protect intake points and inadequate treatment facilities have increased the probability that contaminated and improperly purified water is distributed to consumers in some areas.

Waste disposal. Solid waste management can be considered the most visible environmental health problem in Saint Lucia. Limited financial resources create major constraints. A review of the garbage disposal system was completed in 1992 by CEHI, and a report is to be submitted to the cabinet for discussion in 1993.

With regard to wastewater disposal, in 1992 the Environmental Health Branch processed 425 applications for wastewater disposal systems (89% residential).

Other environmental services. Major services provided under the food quality control program include inspection of premises, inspection of hotels (using a demerit score system), investigation of foodborne illnesses, meat inspection, inspection of other foods, food worker training, and food worker registration.

Vector control activities focus on control of *Aedes aegypti*. Three inspection cycles were completed in 1992, with 38,624 inspections carried out. Other projects include a community-based volunteer program that assists volunteer groups by providing weekly garbage collection and rodent control activities (7,046 premises visited and 2,344 treated in 1992).

A new schistosomiasis control program was started in late 1992 in connection with the Roseau Dam Project.

Health Education and Promotion

Health promotion activities are undertaken not only by the Bureau of Health Education but also by various programs within the Ministry of Health and Local Government and by other governmental and non-governmental organizations, sometimes with technical assistance from international agencies. A healthy lifestyle campaign in 1993 is part of these ongoing activities.

The Ministry of Education introduced family life education into the school curriculum for students at all levels in 1992.

An AIDS hotline began operation in December 1990. By December 1992, 3,428 calls had been received.

The Road Transport Board improved road safety through the installation of traffic lights (first installed in December 1991), street lights, and road markings, as well as an intensive road safety education program and a defensive driving course offered as part of continuing education.

Health Research and Technology

Several health research projects were implemented recently in Saint Lucia with technical assistance from abroad. These projects included a number of KAPB (knowledge, attitudes, practices, and behaviors) surveys regarding AIDS and STDs, conducted between 1990 and 1992; a measles/rubella serosurvey implemented in 1991; and two chlamydia/gonorrhea surveys conducted in 1990 and 1992 among pregnant women and STD patients.

An International Symposium on HTLV-1 was organized in 1990, and an International Symposium on Cervical Cancer in 1991.

Social Mobilization and Community Participation

Several community-based projects have been carried out in Saint Lucia, the most recent ones being the Chateau Belair Excreta Disposal Project (October 1992) and the building of a new health center in Delcer (April 1993).

Available Resources

Human Resources

There were 70 medical doctors and 260 nurses (including 92 nursing assistants) in Saint Lucia in 1991; 63 of the doctors and all the nurses work in the public sector. In addition, there were 9 dentists, 31 pharmacists, and 3 physiotherapists. In-service training represents a major component of total training activities in health for all categories of health personnel, particularly those in the Nursing Department.

In 1991-1992, 60 students (59 females, 1 male) were enrolled at Sir Arthur Lewis Community College in the Division of Nursing Education and Health Science.

Financial Resources

The health budget is the second largest, after that of the Ministry of Education, and represented 10%-14% of the national budget between 1982 and 1992. Recurrent health expenditure accounted for 50% of the total health budget in 1991. That year, health expenditure represented 12.1% of the national expenditure.

Over the past 10 years, the per capita health expenditure has almost doubled: US\$ 1,150.35 in 1991, up from US\$ 582.54 in 1982. The per capita national expenditure reached US\$ 9,501.61 in 1991, a 21% increase over the figure for 1990. In addition, multilateral and bilateral assistance is provided for specific programs.

Physical Resources

Care-giving Institutions. In 1992, the primary health care services were provided through a network of 33 health centers, including two centers constructed and opened in 1992 in Ciceron and Grace; another center was opened in 1993 in Delcer. These centers are strategically located all around the island, so that no person is more than three or four miles from a center. The two district hospitals also provide primary health care. Four health centers have been equipped to serve as obstetric units for normal deliveries, but their contribution in this regard is rather limited, partly because of the scarcity of personnel.

In addition to clinics held by specialists in the various health centers, two community clinics operate at Victoria Hospital: the Hansen's disease clinic and the STD clinic. These clinics owe their existence to specific priority programs, the Leprosy Control Program and the AIDS/HIV/STD Prevention and Control Program.

The secondary and tertiary health care services are provided by six facilities with a total complement of 505 beds in 1992. Victoria Hospital is the main general hospital (184 beds). This general teaching hospital provides surgical, medical, pediatric, gynecological and obstetric, ophthalmologic, and dental services, which are complemented by the opening in 1992 of a new obstetrics and gynecology wing, a nephrology unit, a four-bed intensive care unit, an ear, nose, and throat (ENT) clinic, a cardiology unit, and an endoscopy unit. Other support services are radiology (renovated and equipped), laboratory (upgraded and extended in 1991), physiotherapy, dietary, and counseling. After being privately managed for 25 years, St. Jude Hospital (capacity 114 beds) has been run by the

Government since November 1992. Golden Hope Hospital, a 140-bed mental health hospital, provides in- and outpatient services for psychiatric patients, while Turning Point, a 20-bed drug and alcohol detoxification and rehabilitation center, offers inpatient care and outpatient clinics to alcoholic and drug-abusing individuals. The two district hospitals are located in Dennery and Soufriere, with a bed complement of 20 and 27, respectively.

Some nongovernmental organizations are also directly involved in providing health care services. These institutions work in close collaboration with the Health Ministry.

Laboratories, Blood Banks, Diagnostic and Treatment Services. The medical laboratory services (Ezra Long, St. Jude, Dennery, Anse La Raye, Soufriere) are rapidly being merged into a single unit. There are two blood banks housed in the laboratories of the two general hospitals and one mobile unit. Two private laboratories operate in Castries, and in 1993 a new private diagnostic radiology service began operation.

Drugs and Immunobiological Products. The Medical Supply Department of the Ministry of Health and Local Government is responsible for managing the drug supply. Based at Victoria Hospital, it ensures distribution of drugs to the pharmacies of the various health facilities, where they are provided to patients under the responsibility of a pharmacist.

In 1992 there were 12 private pharmacies in the country.

Extrasectoral Resources

A network of nongovernmental organizations greatly contributes to the success of various health projects. This network includes 60 local NGOs and foreign voluntary organizations represented in Saint Lucia. The private sector also plays a growing role.

Belief in traditional medical practices (bush medicine, panseur, obeah, etc.) is still very strong for many Saint Lucians, although no research has been conducted to assess the extent of the phenomenon. The coexistence of the biomedical model and the ethnomedical model does not generate major problems. However, the lack of communication between the two sectors may have a serious impact on the efficiency of treatment and the cost involved in health care at the household level. More research is needed in that regard.

SAINT VINCENT AND THE GRENADINES

GENERAL HEALTH SITUATION AND TRENDS

Saint Vincent and the Grenadines has been an independent republic since 1979, and it is governed by a parliamentary system. The country, which is part of the Lesser Antilles, is located about 160 km west of Barbados, and encompasses the main island of Saint Vincent and most of the northern Grenadine islands, including Bequia, Mayreau, Mustique, and Union Island. The capital and major port, Kingstown, is on Saint Vincent; the island is 30 km long and has a maximum width of 18 km and a surface area of 374 km².

Health and Living Conditions

Over 1988–1991, economic activity showed a GDP average annual growth rate of 5.3%, while inflation remained low and stable at under 2% on average. The GDP was EC\$ 478.26 million in 1991. By the end of 1991, the per capita income was estimated at EC\$ 4,468, an increase of 40.8% since 1988. The rate of exchange is fixed at EC \$2.68 per US\$ 1.00.

Agriculture, mainly the cultivation of bananas, remains the mainstay of the economy, but other economic sectors such as transportation, wholesale and retail commerce, manufacturing, and tourism are becoming more important. According to the Government Statistical Office, the unemployment rate is 19.76% of the labor force (1991), a decline compared to the 23.53% figure in 1980.

The 1991 population and housing census showed that there were 27,002 households, compared with 20,090 in 1980, for a 34.4% increase. The average size of households decreased from 4.8 persons to 3.9.

Although education is not compulsory, there is almost full attendance at the primary school level. In 1991, 32,175 students were enrolled in 65 public and private primary schools, 21 secondary schools, and 5

post-secondary institutions. It is officially estimated that about 80% of the adult population is functionally literate.

Population

The 1991 population and housing census returned a final count of 106,499 persons, indicating an average annual growth rate of 0.80% since the 1980 census. The average annual growth rate for the last 5 years, however, has been marginally slower (0.69%) than that recorded for the entire decade, reportedly due primarily to migration. In 1988–1991, total net emigration was 3,931. Table 1 shows the population distribution by age group and sex.

The total fertility rate was estimated at 3.8 children per woman for 1985–1990. The crude birth rate was 24.1 per 1,000 population in 1990 and 24.3 in 1991. The crude death rate was 6.5 per 1,000 in 1990 and 6.1 in 1991. The population density increased from 252 per km² in 1980 to 268 in 1988, and to 274 in 1991. In 1990, life expectancy at birth was 67 years for males and 72 years for females.

The coverage and quality of birth registration is quite good—80% of births occur in Kingstown General Hospital and another 10% in rural hospitals. There were 2,537 live births in 1988, 2,564 in 1989, 2,552 in 1990, and 2,591 in 1991.

Mortality

All deaths are medically certified, and the Ministry of Health discusses the quality of certification with doctors.

Chronic diseases are the major contributors to mortality, with heart disease (ICD-9, 410–429), cerebrovascular disease (436), malignant neoplasms (140–208), and hypertensive disease (401–405) ranking highest.

TABLE 1
Population by age groups and sex, Saint Vincent and the Grenadines, 1991 census results.

| Age group (years) | Total | | Male | | Female | |
|-------------------|---------|-------|--------|------|--------|------|
| | No. | % | No. | % | No. | % |
| All ages | 106,499 | 100.0 | 53,165 | 49.9 | 53,334 | 50.1 |
| 0-4 | 12,094 | 11.3 | 6,179 | 5.8 | 5,915 | 5.5 |
| 5-14 | 27,532 | 25.9 | 13,882 | 13.1 | 13,650 | 12.8 |
| 15-24 | 21,958 | 20.6 | 11,146 | 10.5 | 10,812 | 10.2 |
| 25-34 | 17,132 | 16.1 | 8,784 | 8.2 | 8,348 | 7.8 |
| 35-44 | 9,490 | 8.9 | 4,788 | 4.5 | 4,702 | 4.4 |
| 45-54 | 6,170 | 5.8 | 3,027 | 2.8 | 3,143 | 3.0 |
| 55-64 | 5,190 | 4.9 | 2,460 | 2.3 | 2,730 | 2.6 |
| 65 & older | 6,933 | 6.5 | 2,899 | 2.7 | 4,034 | 3.8 |

Source: Central Statistical Office, Preliminary Census Report.

Table 2 shows the country's 10 leading causes of death, with their number of deaths and their percent of the total for 1988-1991.

External causes (E800-E999) (accidents and injuries) have emerged as one of the 10 major causes of mortality. However, within this category, the bulk of the deaths (73.3%) has been assigned to injury undetermined whether accidentally or purposely inflicted (E980-E989), with late effects of accidental injury (E929) being the next most significant cause (14.7%). Deaths assigned to motor vehicle accidents remain low, with only a total of five between 1988-1991.

The 10 leading causes of death accounted for 74.4% of all deaths in the country during 1988-1991. Given the chronic nature of many of these groups of causes, a major health policy to be pursued in the immediate future should relate to the prevention, early detection, and better management of these diseases. This implies that more focused and concentrated health promotion activities should be pursued, as should the better organization and management of the health services.

Morbidity

There is no integrated approach for collecting and collating morbidity statistics and, as such, the available information is both spotty and inconclusive. Given this, the morbidity reports from the 38 primary level clinics provide the best available estimates.

Respiratory infections accounted for 10,442 out of 78,803 total visits to the primary level clinics in 1992 (13.2%); hypertension and/or diabetes accounted for 13,843 visits (17.6%). Skin infections resulted in 5,009 visits (6.3%), followed by helminthiasis with 4,363 vis-

TABLE 2
Ten leading causes of death, number of deaths, and percent of total, Saint Vincent and the Grenadines, 1988-1991.

| Rank order | Cause of death (ICD-9) | Number of deaths | % of total deaths |
|------------|--|------------------|-------------------|
| | Total deaths, all causes | 2,759 | 100.0 |
| 1 | Heart disease (410-429) | 359 | 13.0 |
| 2 | Cerebrovascular disease (436) | 333 | 12.0 |
| 3 | Malignant neoplasms (140-208) | 321 | 11.6 |
| 4 | Hypertensive disease (401-405) | 297 | 10.7 |
| 5 | Endocrine, nutritional, and metabolic diseases and immunity disorders (excluding AIDS) (240-279) | 184 | 6.6 |
| 6 | External causes (E800-E999) | 162 | 5.9 |
| 7 | Diseases of respiratory system (460-519) | 132 | 4.8 |
| 8 | Certain conditions originating in perinatal period (760-779) | 114 | 4.1 |
| 9 | Diseases of blood and blood-forming organs (280-289) | 82 | 3.0 |
| 10 | Diseases of digestive system (520-579) | 75 | 2.7 |
| | Subtotal, ten cause groups | 2,059 | 74.4 |
| | Other defined and ill-defined causes | 710 | 25.6 |

Source: Central Statistical Office, *Digest of Statistics, 1988-1991*.

its (5.5%). Arthritis accounted for 2,629 visits (3.3%). In addition to the major infectious causes of clinic visits mentioned, conjunctivitis and gastroenteritis were also important, accounting for 2,418 (3.0%) and 1,158 (1.5%) of all clinic visits, respectively. The average annual case fatality rate for gastroenteritis for the period 1988-1991 was 5.7 per 1,000. Records show that, on average, 85.5% of the cases of gastroenteritis reported yearly receive oral rehydration therapy as the first line of treatment.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

Perinatal mortality has remained relatively low and stable between 1988 and 1991, despite a peak in 1990, when it was 5.4 per 1,000 live births, compared to 2.8 in 1988, 2.4 in 1989, and 2.7 in 1991. More than 90% of these deaths have been ascribed to prematurity and congenital anomalies, with conditions such as respiratory distress syndrome and birth asphyxia also being

relatively common. The infant mortality rate declined gradually in the 1988–1991 period, from 21.7 per 1,000 live births in 1988 to 19.3 in 1991. The same downward trend was manifested in the neonatal mortality rate—from 10.2 in 1988 to 9.6 in 1991.

The improvement in the health status of children 1–4 years old that was seen during the 1980s has been sustained into the 1990s. The age-specific death rate declined from 2.9 per 1,000 population in 1988 to 1.4 in 1991, an improvement that could be due to a better management of intestinal infectious diseases through the widespread use of oral rehydration therapy and to the improved nutritional status of children. For example, malnutrition in children under 5 years old declined from 6.2% in 1988 to 4.5% in 1991 (Caribbean standard); it is estimated that about 54% of children up to 3 months of age are now fully breast-fed, an increase of 21% over the same period.

The fact that supplementary feeding has been continuously available to pregnant and lactating mothers and to children up to 5 years old since 1984, through the World Food Program, also is significant. Every year since then, 2,800 women and children have benefited from the program.

Saint Vincent and the Grenadines has recorded almost 100% immunization coverage among children 1 year old for diphtheria, pertussis, tetanus, measles, polio, and tuberculosis. Consequently, the incidence of these diseases has been low.

Health of Women

About 30% of all births each year are a woman's fourth or subsequent offspring, and 24% of all births in 1988–1991 were to teenage mothers. Maternal mortality is almost nonexistent, with only one death recorded between 1988–1991, resulting in an average yearly maternal mortality rate of 0.98 per 10,000 live births for the period.

A national cervical cancer screening program is in place, and an average of 2,739 Pap tests were performed annually over the 4-year period 1989–1992.

The maternal and child health manual's prenatal care protocol proposes a minimum of six prenatal visits, with the first occurring by the 16th week of pregnancy. Reports indicate that about 82% of all pregnant women satisfy these criteria.

Regarding postnatal care, the manual stipulates a minimum of three checkups for mother and newborn within the first 10 days after delivery or discharge from hospital, the first of which must occur within the

first 24 hours. The records show a 100% coverage in this area of care, which is reflected in the almost total absence of serious puerperal complications.

Health of the Elderly

In 1988–1991, the major causes of death in the age group 65 years old and older were hypertensive disease, malignant neoplasms, heart disease, endocrine and metabolic diseases, and cerebrovascular accidents. In 1991, the total number of deaths in people 65 years old and older was 373, of which 178 were due to the above-mentioned causes. There are no specialized health care programs directed to the elderly, although some special arrangements are in place for providing certain services and facilities. The Government continues to operate a 12-bed home for the aged poor.

Diseases and Health Impairments

Apart from a few sporadic, non-fatal cases of *dengue*, vector-borne diseases do not feature prominently in the morbidity or mortality profile.

Diphtheria has not been reported since 1978, and there were no reports of *poliomyelitis* in 1988–1991. During 1988–1991 a total of 10 cases of *tuberculosis* and 15 cases of *measles* were reported. The last major epidemics of measles occurred in 1979–1980, when 297 cases were reported, and in 1982–1983, when 820 cases were reported. In 1988 there was one case of *tetanus*, and three in 1989; there have been no other cases since 1980. There were 15 cases of *pertussis* in 1989, the first since 1982.

Regarding *AIDS*, a total of 87 persons were reported to have tested positive for the human immunodeficiency virus (HIV) by the end of 1991, representing a male-to-female ratio of 2.3:1. Of these, 39 (44.8%) had developed *AIDS*, for a male-to-female ratio of 1.4:1. As of the end of 1991, there were 36 deaths (92.3% of all cases).

Unfortunately, the data for other sexually transmitted diseases are not as readily available. Nonetheless, as best as could be ascertained, the average annual incidence rate (1988–1991) for *gonorrhoea* was 3.9 per 1,000, and that for *syphilis* was 0.3 per 1,000. However, there clearly is underreporting, particularly for gonorrhoea.

Dental caries is the country's most pervasive oral health problem. A 1991 study conducted among schoolchildren revealed that 69% of all students surveyed were affected. The problem has been shown to be most acute among 15–19-year-olds, with 87.7%

being affected. Calculus was the most frequent periodontal condition observed, with an increasing tendency the older the age group. In the age group 5–7 years old, 26.2% of children suffered from calculus, while in the age group 15–19 years old, 82.7% were similarly affected.

Mental hospital data show that while the number of admissions for *drug abuse* has gained in significance, the number of admissions for *psychoses* has declined considerably. In the case of the former, this reflects more widespread availability and use of psychotropic drugs in society, as evidenced by increases in both the number and volume of police seizures of cocaine and marijuana and the number of convictions secured by the courts for possession. The decline in the number of admissions of psychotics (29.2% decline in 1991) is largely the result of an expanding community mental health service.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

General Policies

The Government's overall strategy for economic growth, as articulated in the 1991–1995 National Development Plan, centers on increasing output and improving productivity, particularly in the agriculture, education, and tourism sectors. By the same token, it has been acknowledged that economic growth and development, although compatible, are not synonymous, and that efforts should be made to ensure that benefits from growth reach society's disadvantaged members.

The social development policy focuses on the need to promote self-sufficiency for disadvantaged groups, such as by encouraging the community to work together to solve its own problems. This policy has been put into practice in all major sectors—agriculture, health, education, housing, and overall community development.

Population Policies

The population strategy's overall objective is to reduce the population's rate of growth, and, secondly, to decrease the incidence of teenage pregnancy. Specifically, the Ministry of Health and the Environment proposes to increase the participation of women of child-

bearing age attending family planning clinics from 50% to 65% in 1991–1995. This is estimated to increase the national contraceptive prevalence from 61% (1990 level) to almost 75%. Programs to reduce births to teenage mothers from 23% of total births (1991 level) to 17% also will be implemented.

Health Policies and Strategies

The Government embraces the following tenets:

- Access to health care is a basic human right and an integral part of national development.
 - All citizens have the right and duty to participate individually and collectively in the planning, implementation, and evaluation of their health care services at all levels.
 - Health cannot be achieved through the efforts of the health sector alone, but must be accomplished through close collaboration with all other sectors.
 - The fullest and best use must always be made of national resources to promote health and development.
- Consequently the Government's policy is to:
- Provide comprehensive and affordable health care services at the primary, secondary, and tertiary levels.
 - Facilitate intrasectorial and intersectorial coordination in the provision of health care to the population.
 - Strengthen linkages with the community, including private-sector and nongovernmental organizations, in the provision of health care.
 - Institute the necessary regulatory mechanisms to ensure the availability of quality health care.
 - Establish dynamic management systems to facilitate the delivery of effective and efficient health care.

Over the past 10 years, the Ministry of Health and the Environment has pursued the development of local health systems as a major strategic approach. To this end, district health teams and health committees have been established in all geographical areas, and they are responsible for planning, programming, and evaluation at the local level.

Organization of Services

Personal Health Care Services

Infrastructure. The country's health care facilities are almost exclusively government-owned and operated. Kingstown General Hospital is the only acute care, referral hospital operated by the government,

and there are five small rural hospitals. In 1991, 207 of the 265 acute care hospital beds in government institutions were located in Kingstown General Hospital; the remaining 58 were distributed among the five rural hospitals—22 in Georgetown Rural Hospital, 12 in Mesopotamia Rural Hospital, 6 in Chateaubelair Rural Hospital, 12 in Bequia Rural Hospital, and 6 in Union Island Rural Hospital.

There are also two acute care, private hospitals (each with a 12-bed capacity) based in Kingstown. The psychiatric hospital and the geriatric hospital (Lewis Punnett Home), each with 120 beds, complete the list of hospital care facilities.

In terms of community health services, there are 38 clinics spread over the nine health districts. Each clinic is staffed by a district nurse/midwife, a nursing assistant, and a community health aide on a full-time basis. Two new clinics have been built since 1988, one by the Government (Clare Valley) and the other through the initiative of a local nongovernmental organization (Overland). On average, each clinic services a population of 2,802 persons.

Coverage. Kingstown General Hospital provides specialist care in the areas of medicine; general and orthopedic surgery, obstetrics and gynecology; pediatrics; ophthalmology; ear-nose-and-throat; radiology; and emergency medical care. In 1991, the obstetrical and surgical wards had the highest occupancy rates (81% and 77%, respectively), and pediatrics (41%) had the lowest.

The accident and emergency department has predictably been the most active. In 1991, a total of 22,564 patient visits were recorded at this department, and a total of 43,072 visits were recorded for other types of ambulatory and specialist care at Kingstown General Hospital. The fact that surgical procedures increased by 69.8% between 1988 and 1991 (from 1,488 in 1988 to 2,526 in 1991) also is noteworthy. This has been as much the result of the availability of consultants on a continual basis as of the commissioning of an additional operating theater.

With regard to patient turnover, as reflected in admissions and discharges, a fairly significant increase has been observed since 1988. The turnover rate increased each year during 1988–1991, from 36 in 1988 to 42 in 1991. By far the most active in this respect was the maternity ward, with an average of 29.3% of the admissions and 32.1% of the discharges over the period. This was followed by the pediatric, surgical, and medical wards, in that order. In 1991, the total number of admissions to Kingstown General Hospital was 8,651, compared to 7,379 in 1988. Average length of stay was

6.0 days in 1991, not much different from the previous years (6.1 in 1988 and 1989, 6.3 in 1990).

At the community level, a total of 95,335 visits were recorded at the clinic level in 1991, a 23.7% increase since 1988. The areas that increased most significantly were visits at district medical officer clinics, emergency care (casualties and dressings), and hypertensive and diabetic clinics. A total of 36,072 home visits also were undertaken in 1991 by district nurse/midwives, nursing assistants, and community health aides, who conducted 89.2% of them.

In 1992, there was a community mental health service geared towards early detection and domiciliary rehabilitation of mentally ill patients in six of the nine health districts.

The central laboratory attached to Kingstown General Hospital is the country's only functional pathology laboratory. In 1991, 65% of all investigative procedures undertaken were for outpatients; the remainder were carried out in response to hospital requests. Laboratory tests are conducted in the areas of microbiology, serology, parasitology, urinalysis, hematology, and biochemistry. Altogether, slightly more than 300,000 laboratory tests were completed in 1991.

In the last 5 years, the trend indicates that an average of 80.6% of all births in the country occur at the Kingstown General Hospital, an 8% increase since 1983. The 1991–1995 health sector plan proposes to reverse this trend by increasing the number of births occurring at the district level to 40% of the total by the end of the plan period, primarily through a strategy involving the establishment of five maternity centers at strategically located clinics.

Immunization of the vulnerable population has remained high, with almost 100% coverage in all areas. In 1989, for an estimated target population of 2,482 children under 1 year old, the following coverage rates were achieved: 98% for DPT-3, 97% for OPV-3, 100% for measles, and 99% for BCG. In 1990, coverage rates on a target population of 2,505 children were 98%, 92%, 96%, and 100% for the respective vaccinations; in 1991 the respective figures were 97%, 97%, 100%, and 100%.

These high levels have been accomplished through an aggressive expanded program on immunization available at all public and private health care facilities, which is supported by the 1982 Immunization Act that requires all children to be fully immunized before entering school. The "Measles Elimination Month" campaign, held in May 1990, recorded 92% coverage.

In 1991, the Government's National Family Planning Program provided contraceptive services to 55.4% of

all women of childbearing age. The most popular method is oral contraceptives (67.3%), followed by injectables (21.3%). The popularity of intrauterine devices has declined sharply; only 5.1% of active participants now favor this method, as opposed to 13.8% in 1986.

The School for Children with Special Needs is the only institution offering any organized services for children with disabilities. Although established primarily to provide children with coping skills to overcome their disabilities, the school has fully incorporated a health care component into its program that requires that all students be fully immunized and follow a regimen of regular medical checks. In 1991, 136 children were enrolled in the school.

Environmental Services

Infrastructure. Responsibility for environmental health management rests with the Ministry of Health and the Environment, which, through its Environmental Health Division, monitors solid and liquid waste management, water quality, vector control, food protection and port health.

Most of the organized environmental health services offered to the public are provided free of cost. For example, refuse collection and disposal service is provided gratis to owners of premises, although the Government employs private contractors for additional assistance; about 64% of the population is served in this way.

Services. The Central Water and Sewerage Authority, a statutory body, is responsible for supplying water to the public at a metered cost. There are three major water sources and several smaller ones; all major sources are routinely treated for bacteriological contamination.

In 1991, almost one-half of all households (12,848 of a total 27,002, or 47.6%) had water piped into their homes or yards from the public supply system, and a further 29.4% received their water from a public stand-pipe. Thus, more than three-quarters of the population (77%) may be said to have had access to a reliable potable water supply in 1991, while 3,027 households (11.2%) received their supply from private tanks, drums, or other containers, and 279 households (1.0%) used a public well.

It should be noted that 10.8% of households still received their domestic water supply from suspect sources such as springs, rivers, streams, and other communal catchments.

In 1991, pit latrines were by far the most prevalent means of sewage disposal (used in 16,815 households, or 62.3%), followed by the septic tank (used in 8,141 households, or 30.1%). The number of households without any approved form of sewage disposal (1,002) declined from 8% in 1980 to 3.7% in 1991.

Health Promotion

The Health Education Unit, which was established in 1981, is one of the newest programs within the Ministry of Health. Its major areas of focus are information and education, training, and community organization. Programs are delivered through regular mass media activities, the production and distribution of graphic materials, the conduct of workshops for health care workers and other community members, and the carrying out of other outreach activities.

In 1991, the health promotion partnership between the private and the public sectors broke important new ground when an insurance company fully sponsored the daily radio program, "Health Word," for an indefinite period. It is an achievement which bears replication in other areas of health promotion.

Social and Community Participation

The continuing emphasis on the development of district health teams and health committees, which is part of the strategy to strengthen local health systems, embraces greater social participation in health as one of its objectives. These bodies have been established at all district and clinic levels, and under this arrangement, organizations, groups, and individuals are encouraged to participate in all aspects of health programming.

Some of the health projects in which communities have actively participated include improvement in family planning services, reduction of adolescent pregnancies, control of worm infestation, construction of toilet facilities for underprivileged persons, and improvement of communal refuse disposal. Although these projects have been undertaken with varying degrees of success, they all demonstrate the usefulness of meaningful community involvement in primary health care activities.

The recently established integrated vector control program aims at eradicating the *Aedes aegypti* mosquito and at reducing the prevalence of other species through a community participation approach.

Available Resources

Human Resources

Currently, 84% of all permanent positions provided for by the Government's annual budgetary estimates are filled. This is considered particularly gratifying, given the uncertainty that existed up to 1990 in critical categories such as medical doctors, dentists, and nurses. Chronic vacancies in the areas of laboratory and pharmacy services remain in the system. Within the last 5 years, improving staffing at the community level has been greatly emphasized; to date, all rural clinics are completely staffed with full-time workers.

In 1991, available human resources in health included 55 medical doctors (6.1 per 10,000 population), 6 dentists (0.6), 27 pharmacists (2.7), 224 nurses (all categories) (21.0), 141 nursing assistants (13.5), 8 dental nurses (0.7), 39 community health aides (3.7), 2 hospital administrators, 3 veterinarians, 8 nutritionists, and 13 laboratory technologists/technicians.

Only 7% of the available trained human resources work outside the public sector, including 5 doctors, 3 dentists, 8 pharmacists, 2 hospital administrators, 1 veterinarian, 2 nutritionists, 1 laboratory technician, 12 nurses, and 3 nursing assistants. Certain categories of health workers were employed exclusively in the public sector, including 20 environmental health officers, 8 dental nurses, 1 medical records statistician,

4 radiographers, 3 X-ray technicians, and 2 physiotherapists.

Of the 55 doctors, 33 were general practitioners. The 22 medical specialists included 4 general surgeons, 3 gynecologists, 2 pediatricians, 2 dermatologists, 2 ophthalmologists, 2 internists, 2 anesthesiologists, 1 radiologist, and 1 ear-nose-and-throat specialist.

Financial Resources

The actual government expenditure on health has averaged 15.4% of total recurrent expenditure since 1988. In 1991, total recurrent government expenditure amounted to EC\$ 149.1 million; the recurrent expenditure on health care was EC\$ 22.1 million (14.8% of total government recurrent expenditure). This ranks health as the second largest consumer of government financial resources, behind education.

In 1991, administrative costs accounted for 43.9% of this expenditure, with the remainder allocated to direct health services. Kingstown General Hospital remains the single largest beneficiary (34.3%) of recurrent health expenditure, followed by the medical stores department (12.2%) and environmental health services (10.8%). The precise amount of resources deployed at the local level is extremely difficult to ascertain, mainly because these resources are spread across vertical program areas, some of which serve both central and local levels.

SURINAME

GENERAL HEALTH SITUATION AND TRENDS

The country's economy is characterized by large fiscal deficits, inflation, a growing discrepancy between official and parallel exchange rates, declining real wages, dwindling exports, a growing gap between the "haves" and the "have-nots," and shrinking employment opportunities.

In 1990, the total domestic money volume stood at Sf 2,400 million, which represented an increase of more than 400% compared to 1982. Inflation was 26% in 1991 and 54% in 1992. These figures are based on a package of goods and services designed in the 1960s that includes food items, clothing, footwear, and housing and domestic items, but that excludes many consumer goods related to nutrition, transportation, entertainment, and education. It has been said that these exclusions may result in an underestimation of inflation, and some claim that the parallel exchange rate for the US\$ is a better indicator of inflation in a country where almost everything must be imported.

Between January 1992 and April 1993, the exchange rate ranged from US\$ 1:Sf 1.77, as the Central Bank's official rate, to US\$ 1:Sf 24.05 in currency auctions, while the parallel market for this period progressively climbed from US\$ 1:Sf 18 in January 1992 to US\$ 1:Sf 60 in March 1993. This unstable exchange rate has particularly harmed the productive sector, which must have access to foreign exchange for the purchase of inputs. According to the Inter-American Development Bank, total investments in the productive sector had declined to 1% of the GDP by 1992. In addition, according to the 1991 annual report of De Surinaamsche Bank (Suriname Bank), imports at unofficial foreign exchange amounted to US\$ 175 million in 1991, but they had a real market value of Sf 3,100 million, based on a mean parallel rate of Sf 18 for US\$ 1. This means that most of the country's imports came in at parallel market rates.

Health and Living Conditions

Inflation is coupled with large and growing imbalances in income distribution: about 70% of the popula-

tion is under the poverty line (Sf 1,658 per month in 1993). The number of available jobs in the formal sector declined from 98,400 to 87,300 (14%) from 1982 to 1991. In the same period, the primary productive sector showed the worst decline (32%, from 22,600 to 17,000). In the service sector the decline was only 5% (from 59,700 to 57,500), mainly because the number of government jobs increased 17%, from 35,300 in 1982 to 45,300 in 1991. In 1992, the public sector accounted for almost 50% of total formal sector employment. Civil service reform is expected to reduce the number of government jobs.

Official unemployment is estimated at about 33% of the economically active population, although the emergence of an informal economy and the lack of national data about this sector put this figure in some question. In 1989, the General Bureau of Statistics estimated that approximately 20% of the economically active population in Paramaribo and in Wanica District, a relatively small district surrounding that city, worked in the informal sector. Another element in the informal sector is the large amount of money and gifts sent to Suriname by Surinamese living in the Netherlands. Conservative estimates put the worth of these parcels at US\$ 27 million for 1992.

Labor surveys conducted between 1987 and 1990 that considered activity in the informal sector show unemployment for the period declining from 19% to 14%, or from 26.5% to 22.5% depending on which definition of unemployment was used. The largest groups of unemployed are those under 30 years old, and many skilled persons in this age group are leaving the country.

Economic distortions and the bush war that raged from 1986 to 1992 have seriously damaged the country's communities and institutions. The war displaced thousands of people from the Interior (about 80% of the country's total land area). About 7,000 refugees who had fled to French Guiana returned in 1992, and many moved into Paramaribo, joining the estimated 13,000 displaced persons already there and straining the housing and utilities infrastructure of the city even further. There are no adequate housing and public services in their tribal lands, because the rebuilding of destroyed roads, schools, health centers, police stations,

and other facilities in the Interior is hampered by logistical and financial problems.

The Government has begun a structural adjustment program that aims at correcting economic imbalances, reducing government deficits, and laying a foundation for economic growth and social justice. The program's implementation is progressively raising prices, as the Government phases out foreign currency allocations and the dual exchange rates for foreign currency are eliminated. The structural adjustment program contemplates the strengthening of social programs through improvements in health care, welfare services, education, and social housing, and through special subsidies for people below the poverty line; unfortunately, government and non-governmental organizations lack the necessary skilled personnel and information systems to manage these programs. Moreover, these economic adjustments may negatively affect the health care sector. The reduction in government budgets affects the availability of resources for health care, especially in the public sector. Tariffs for hospitals and utilities (drinking water, electricity, and other services) also are being adjusted to reflect real costs, and these measures affect most of the population.

The Warwick Research Institute has acknowledged that poverty increased at an accelerated rate and that the gap between rich and poor widened as a result of economic developments. It also has been noted that the number of requests for social support increased in groups that had not made such requests in the past. Furthermore, it appeared that many property owners could not meet operations and maintenance costs for their buildings, cars, and other capital goods. The economic crisis led to an increase in poverty from 30% in 1980 to 39% in 1989, based on the Sf 800 level set by the Ministry of Social Affairs for a household of five persons. This figure would be much higher if the level set by the General Statistics Office (Sf 1,104 per month for a household of five) were used as a comparison. Poor households have an average of 1.6 working members, versus an average of 2.2 in all households.

In 1990, it was estimated that between 55% and 85% of employees were earning wages below the poverty line. The lowest wages are being earned by government workers. Of the persons under the poverty line, 48% have government jobs, 25% have jobs in the private sector, and 27% work in the informal sector.

The effects of poverty are not evenly distributed within the population. One-parent households (often headed by women) suffer disproportionately, as do certain urban neighborhoods, some districts, and population groups such as refugees, low-income house-

holds, the unemployed, the chronically ill, the handicapped, and the elderly.

Women's roles are largely restricted to traditional ones as mothers and housewives, although the proportion of jobs held by women in the formal sector has increased: 30% in 1980, 32% in 1986, and 39% in 1990 (in Paramaribo and Wanica). However, female unemployment simultaneously increased from 21% in 1986 to 26% in 1989. Of those employees working less than 15 hours per week, more than 80% were females, and of those working 15 to 24 hours per week, females accounted for 74%. Of all female employees in the formal sector, 34% reported an income of up to Sf 450 per month in 1989; for male employees in the same sector this figure was 18%.

Population

According to the Vital Statistics Office, the country's registered population was approximately 447,000 in 1991, although the Office itself considers this an overestimate, and gives 404,000 as a better estimate for that year. The difference is explained by the fact that many people who emigrate from Suriname do not register with the Vital Statistics Office, even though this is a legal requirement. For example, emigration figures for the period 1987-1991 show a discrepancy between emigration figures in Suriname (3,490) and corresponding immigration figures in the Netherlands (32,834); it has been estimated that approximately 300,000 Surinamese live in the Netherlands, and that about 50,000 emigrated illegally during the 1980s. Research has shown that about 93% of persons who leave go to the Netherlands; the remainder go to neighboring and other countries.

Immigration figures have remained relatively constant in recent years: approximately 2,300 legal immigrants per year in 1989-1991, most from the Netherlands, Guyana, and Haiti; there are no figures on illegal immigration. There are suggestions that many Guyanese and Haitian laborers are leaving Suriname as a result of the deteriorating economic situation.

As of 1 January 1993, the estimated population of Suriname was 420,000. Most of the country's population (65%) is concentrated in Paramaribo and in Wanica District; about 12% of the population lives in coastal villages. The war in the country's Interior from 1986 to 1992 significantly affected population movements.

There is a long-term trend toward urbanization. In 1989-1991, about 9,000 internal migrants were registered, most of them moving between Paramaribo and

Wanica, but the underregistration of migrants is considered to be high. For example, in Pontbuiten, the official registered population was 11,964 in July 1991, but a household survey in February 1992 estimated at least 16,000 inhabitants. Similar problems exist in the Interior.

According to the 1980 census, 50% of the population was under 20 years old, and the population is almost evenly represented by males and females in all age groups. The ethnic breakdown continues to be 36% Hindustani, 31% Creoles, 15% Javenese, 10% Maroons (Bushnegroes), 2% Amerindians, 2% Chinese, and 4% others.

The latest available figures show that crude birth rates dropped from 31 per 1,000 population in 1977, to 26.1 in 1986, and 22.5 in 1991. Fertility rates also have declined, from 133.6 per 1,000 women aged 15–44 in 1985 to 106.0 in 1990. High contraceptive use, abortion, emigration, and underregistration in the Interior are believed to be factors in these decreases. The crude death rate dropped from 7.2 per 1,000 population in 1986 to 6.4 in 1991. Life expectancy at birth was estimated at 68.8 years for males and females combined.

Mortality

The inadequate registration of causes of death and disease makes it difficult to give a clear picture of the most important causes of mortality and morbidity. Overall, birth and death registration is satisfactory because of financial benefits or controls. In 1988–1990, 7,966 deaths were recorded by the statistics office, of which 6,536 (82%) were medically certified. This was an improvement compared to 1985–1987, when 78% of 7,932 registered deaths were medically certified. Of 2,091 certified deaths in 1990, 13.2% were classified under “ill-defined conditions,” about the same percentage as in earlier years. In 1988–1990, 68% of all medically certified deaths were due to the 10 leading causes of death—hypertension and heart disease (ICD-9, 393–429) (19.0%); external causes (excluding suicide) (E800–E949, E960–E999) (10.4%); cerebrovascular disease (430–438) (8.2%); malignant neoplasms (140–208) (8.2%); certain conditions originating in the perinatal period (760–779) (8.0%); intestinal infectious diseases (001–009) (3.5%); diabetes mellitus (250) (3.1%); pneumonia and influenza (480–487) (3.0%); chronic obstructive pulmonary disease (490–496) (2.4%); and suicide and self-inflicted injury (E950–E959) (2.1%).

Of great significance in terms of the country’s leading causes of death is the increasing importance of deaths due to external causes (excluding suicide) and the decreasing importance of suicides. After peaking in 1985, suicides declined sharply, which was attributed to reduced availability of agricultural poisons—agricultural poisons accounted for 69% of suicidal deaths in 1981–1984, but fell to 52% in 1988–1990; suicides by hanging accounted for 43% of suicidal deaths in 1988–1990, and only 5% were due to the use of firearms. It must be noted that the actual figures for external causes (excluding suicide) are probably higher. There has been much underreporting because of disruption of police work during and after the 1980 coup and during the bush war in the Interior, as well as the general breakdown of information systems in recent years.

Another significant trend in mortality is the fact that the number of deaths due to traffic accidents has dropped significantly for 1988–1990, as compared to previous 3-year periods, a decline that seems correlated with a drop in the number of mopeds on the country’s roads.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

Estimates of infant mortality rates per 1,000 live births were 20.6 in 1988, 22.1 in 1989, and 20.9 in 1990. In children under 5 years old, intestinal infectious diseases (001–009) is the most important cause of death. The mortality rate due to diarrhea for 1988–1990 was 5.7 per 1,000 children under 1 year old; in 1982–1986, the rate was 4.1. In children 1–4 years old, mean mortality due to gastroenteritis was 23.3 per 100,000 children per year. Diarrheal diseases generally do not show up as countrywide epidemics, but tend to occur in small localized epidemics. Seen on a national, long-term scale, gastroenteritis increases during the rainy seasons, but this is not necessarily the case for local outbreaks. In 1991–1992, the highest local incidence rates of gastroenteritis were observed in Kwamalasamutu, Amerindian territory near the border with Brazil. An increase in gastroenteritis cases was reported by the combined sentinel stations (27 sentinel stations scattered throughout the country, including private and public polyclinics, general practitioners, and medical specialists) for 1989–1992: from 862 in 1989, to 1,359 in 1990, 2,485 in 1991, and about 4,500 in

1992, although this increase may have been partly the result of intensified surveillance. Reported incidence rates increased from 17.6 per 1,000 children under 5 years old in 1989 to 91 per 1,000 in 1992.

Other major causes of mortality in children 1–4 years old are external causes, with a death rate of 25.7 per 100,000 recorded for 1988–1990. The mortality rate for pneumonia in this age group was 20.9 per 100,000 per year in this same period.

Perinatal mortality rates were 17.6 per 1,000 live births in 1988, 20.7 in 1989, and 18.9 in 1990. Infant mortality and perinatal mortality have not been computed for the Interior, but it was noted that each year before the war (1985 and earlier) about 20% of infant mortality occurred in the Interior, while only about 10% of births took place there. In 1986–1990, after the onset of the war, only between 4.3% and 13% of total registered infant mortality came from the Interior.

In 1987, between 11.3% and 13.2% of births in public hospitals and health centers were below 2,500 g. There are no recent figures on the incidence of low birthweight in Suriname, but in January 1988, a survey conducted at 's Lands Hospital (where almost one-half of all children are born), showed the following maternal risk factors associated with low birthweight: age under 20; only primary school education or less; height under 150 cm; Hindustani ethnic heritage; and a parity of zero. Most low birthweight births were to mothers of lower socioeconomic status, except in the Hindustani group, in which low birthweight babies were distributed more evenly across socioeconomic strata, which may be accounted for by either cultural or other factors.

In the age group under 1 year old, conditions originating in the perinatal period and congenital anomalies constitute the major causes of death.

In the period 1988–1990, accidents (E800–E949) was the leading cause of death among 1–4-year-olds and among children aged 5–14 years old. Among 5–14-year-olds the death rate due to accidents was 14.1 per 100,000 for the 3-year period, with boys outnumbering girls 1.5 to 1.

The prevalence of malnutrition (as measured by anthropometric criteria) has been on the rise in recent years. The number of hospitalizations of children under 5 because of malnutrition was 53 in 1987, 33 in 1988, 64 in 1989, 123 in 1990, and 114 in 1991. In recent years, the prevalence of acute malnutrition (weight-for-height below P3 of the United States National Center for Health Statistics [NCHS] standards) has been rising among primary schoolchildren in Paramaribo. In the school year 1985–1986, among 1,820 first graders screened by the School Health Service, 12% had a

weight-for-height below the P3 level. In the school year 1987–1988, the same 29 schools again had a score of 12%; in the following school year the score jumped to 18%.

In the 1989–1990 school year, a Bureau of Public Health survey found that among first graders aged 5–8 years old from 33 schools in Paramaribo who were weighed and measured (out of a total of 113 primary schools), 13.5% had a weight-for-height below P3. There was great variation among schools in different neighborhoods, with the highest prevalences of acute malnutrition reported for schools in urban, lower-class neighborhoods in southwest Paramaribo. Chronic malnutrition (defined as height-for-age below P3) was seen in only 4% of the first graders studied; the schools and neighborhoods with the worst nutritional scores also were the ones with the highest influx of refugees from the Interior. In the first half of 1990, a Bureau of Public Health survey found 22.3% malnutrition (weight-for-age below P3) among children under 5 in selected locations in Paramaribo.

In 1991, the Bureau of Public Health found higher rates of acute and chronic malnutrition in two Amerindian villages in the deep south than in five Bushnegro villages in Brokopondo. In the Amerindian villages, 28% of children under age 5 had a weight-for-age under P3 (NCHS standards); in the Bushnegro villages the comparable figure was 11%. Acute malnutrition (weight-for-height below P3) was seen in 8% of the Amerindian group and in 3% of the Bushnegro group. In both populations of children under 5 years old, acute malnutrition was seen mainly among 1–2-year-olds—in 22% of Amerindians and 8% of Bushnegroes. Chronic malnutrition (height-for-age below P3) was found in 35% of Amerindian 1–2-year-olds and in 32% of 3–4-year-olds. The figures for the Bushnegroes were 16% and 11%, respectively. The Brokopondo villages are located in a relatively developed area, and the anthropometric data of children from these areas are not typical for all Bushnegro children.

Adolescent and Adult Health

In 1988–1990, as in earlier periods, about 50% of medically certified mortality in males 15–44 years old was due to external causes (E800–E999). In females aged 15–44 years, the comparable figure was 25% of certified mortality.

The age- and cause-specific mortality rate due to external causes in the age group 15–44 years old was 86 per 100,000 population for 1988–1990; corrected for un-

dercertification (assuming that the proportion of deaths from external causes was the same among the medically certified and the noncertified deaths), the figure was 105 per 100,000 population per year.

For the same period, in males 15–44 years of age, the five leading causes of death were: accidents (E800–E949), 253 deaths; suicide (E950–E959), 73 deaths; hypertension and heart disease (393–429), 65 deaths; homicide, legal intervention, and acts of war (E960–E978), 25 deaths; and malignant neoplasms (140–208), 17 deaths. In women, the leading causes were: accidents (E800–E949), 82 deaths; hypertension and heart disease (393–429), 39 deaths; malignant neoplasms (140–208), 38 deaths; suicide (E950–E959), 20 deaths; and cerebrovascular disease (430–438), 15 deaths.

In 1988–1990 there was an increase in certified mortality due to accidents and injuries undetermined whether accidentally or purposely inflicted (E800–E949, E980–E989) among females in the age group 15–44 years old, from 35 in 1982–1984, to 21 in 1985–1987, and to 82 in 1988–1990. No analysis was made of the reasons for this steep increase.

In the age group 45–64 years old, hypertension and heart disease (393–429) remained the most important group of causes of death, with a rate for 1988–1990, corrected for undercertification, of 247 per 100,000. This was followed by malignant neoplasms (140–208), 114 per 100,000; accidents and injuries undetermined whether accidentally or purposely inflicted (E800–E949, E980–E989), 87.9 per 100,000; cerebrovascular disease (430–438), 81.6 per 100,000; and diabetes mellitus (250), 55.9 per 100,000.

One of the most significant developments affecting the health situation of the population, especially the group aged 15–44 years old, is the increasing incidence of violence in recent years. In 1977–1983, an average of 14 arrests for murder or attempted murder and manslaughter were registered by the police of “Gewest Paramaribo” each year; in 1984–1989, the average was 37 per year.

In Paramaribo, while the number of arrests for sexual crimes remained relatively constant at about 60 yearly, there were increases in the number of arrests for violent robbery (from 167 in 1977 to 597 in 1989) and for murder and manslaughter (from 15 in 1977 to 48 in 1989).

Suicide was still an important cause of death in 1988–1990. The death rate for suicide in the 15–44 age group, for this period, was 20.6 per 100,000 population (corrected for undercertification). However, there was a decline in numbers of certified deaths due to this cause. For males the numbers of certified deaths were

124 in 1982–1984, 86 in 1985–1987, and 73 in 1988–1990; for females the certified deaths were 44, 23, and 20, respectively.

Health of Women

Another important trend was the continuous decline over the three consecutive 3-year periods in the number of females dying from complications of pregnancy: 23 in 1982–1984, 14 in 1985–1987, and 11 in 1988–1990. In the past decade (1981–1990) the maternal mortality rate has fluctuated between 7 and 9 per 10,000 live births. This is more than likely an underestimate, since preliminary results of a special ongoing study suggest that the figures could be more than twice as high. In 1988, a total of 1,500 of the 9,094 births (or 16.5%) occurred in mothers younger than 20.

In 1988, a survey conducted by Stichting Lobi, in a sample of 556 women aged 15–44 in Paramaribo and in Wanica District, found that 54.7% of women were using contraceptives. The use of contraceptives was highest among married women (85.7%), followed by women with a visiting partner (49%), and women who were engaged (44.4%). About 62% were aware of at least three contraceptive methods. A survey among students attending primary level vocational schools showed that 61.6% of sexually active students did not use contraceptives, although they also stated that they did not want to get pregnant.

Health of the Elderly

In the age group 65 years and older, hypertension and heart disease was the leading cause of death, with a rate (corrected for undercertification) of 1,859 per 100,000, followed by cerebrovascular disease (909 per 100,000), and malignant neoplasms (738 per 100,000).

Diabetes mellitus (250), chronic obstructive pulmonary disease (490–496), and pneumonia (480–486) also are important, although deaths from pneumonia declined in 1988–1990 when compared to previous 3-year periods.

Diseases and Health Impairments

AIDS and Other Sexually Transmitted Diseases

As of 31 March 1993 a cumulative number of 141 AIDS cases had been reported. At that time only 16

were still alive. As of 31 December 1992, a cumulative total of 293 cases of AIDS and HIV-positive cases had been reported. The male-to-female ratio in this group was 1.8 to 1. For AIDS cases alone the ratio was 2.4 to 1.

The ethnic breakdown of HIV-positive persons was 143 Creoles (49%), 53 Hindustani (18%), 44 Bushnegroes (15%), 8 Amerindians (3%), 6 Javanese (2%), and 23 others and unknowns (12%). Transmission of HIV in Suriname has been mainly through sexual contact. Only one case is known to have been acquired through blood transfusion. There have been 17 cases of perinatal transmission of HIV as of 31 December 1992.

While the numbers of cases of sexually transmitted diseases seen at the country's two STD clinics from the early 1980s up to 1991 had declined, in 1992–1993 the number of cases increased. The reported incidence of syphilis per 100,000 population was 9.9 in 1990, 12.2 in 1991, and 48.2 in 1992. The incidence of gonococcal infection per 100,000 population was 379 in 1989, 292 in 1990, 245 in 1991, and 241 in 1992.

Vaccine-preventable Diseases

The last case of confirmed poliomyelitis was seen in 1982, and it was vaccine-related. Since then, no other confirmed case has been found, up to August 1993. Eight suspected cases of poliomyelitis were investigated in 1991 and six in 1992; the diagnosis of poliomyelitis was discarded upon investigation in all the cases.

In 1988–1992 no cases of diphtheria were reported, but there were 33 reported cases of suspected pertussis in 1990. In 1988 and 1989, one case of neonatal tetanus was seen in each year, but there were no cases in 1990–1992. There also were two cases of tetanus per year in 1988–1991; no cases were seen in 1992.

In 1990, there was a rubella epidemic; it was followed by a smaller outbreak in 1992, when 17 suspected cases were reported from July to December. There were 58 suspected measles cases in 1988, 52 in 1989, 38 in 1990, and 40 in 1991.

The Expanded Program on Immunization began in Suriname in 1976, with the vaccination of children under 1 year old against diphtheria, pertussis, tetanus, and poliomyelitis. After a large measles epidemic in 1980–1981, measles vaccination was included in the routine immunization schedule. Rubella vaccine is given to girls in the first year of grammar school.

There has been a decline in vaccination coverage since 1986, because the war in the Interior cut off 10%–12% of the population from government services.

In 1990, the national coverage rate for DPT and polio was 79.1%, and in 1991 it was 74.5%. In 1992, vaccination coverage dropped to extremely low levels. In the coastal area, the Regional Health Service achieved only 53.6% coverage. Although this figure does not include the results of the Medical Mission—the agency responsible for delivering medical care in the Interior—the national figure will probably not rise significantly when these results are taken into account. A major reason for the low coverage rates in 1992 was the fact that in that year no DPT or polio vaccine was available in the country for 3 to 4 months. Other reasons for the low coverage rate are the breakdown of the public transportation system and the fact that as more and more women join the ranks of working mothers, no provisions have been made to facilitate the immunization of their children.

While coverage rates have been slipping, drop-out rates are on the rise. Without reliable recent national statistics, these trends can be illustrated from data gathered from nine local communities. In 1991, coverage for the first dose of DPT and polio was 83% in Lattour District, 89% in Pontbuiten District, and 53% in Para District, while for the third dose coverage dropped to 59%, 74%, and 51%, respectively. For the same year, the coverages in the nine communities for the third dose ranged between 18% (West Suriname, in the Interior) and 74%. In central Paramaribo, coverage was 60.8% in 1991 and 73.7% in 1992.

National measles vaccination coverage reached only 57.4% in 1990, 62.1% in 1991, and 67.8% in 1992, but it increased with a special measles campaign in 1992, in which 43,195 (94%) from an estimated target population of 46,000 children under 5 years old were vaccinated.

A survey carried out in 1992 in the neighborhood of Pontbuiten and in the district of Meursweg found that the vaccination status of children under 5 years old in Pontbuiten varied according to sex and ethnic group, with 61% of the boys and 54% of the girls having had a complete vaccination; 39% of Bushnegro children and 62% of non-Bushnegro children were adequately vaccinated. In Meursweg there was a significant relationship between family situation and vaccination status of children under 5 years old—only 54% of children with absent fathers or who lived in other miscellaneous arrangements were adequately vaccinated, as compared to 75% of children who lived with both parents. In Pontbuiten the comparable figures were 51% and 60%, a nonsignificant difference, given the relatively low numbers observed.

The vaccination status of children in this age group also varied according to financial arrangements for

medical care. In Pontbuiten there was no significant difference in the percentages of adequately vaccinated children in different financing categories, from 52% for those with state health insurance to 64% for those attended by the Ministry of Social Affairs; in Meursweg, however, the children with state health insurance had significantly lower vaccination coverage (59%) and the ones with company insurance had significantly higher vaccination coverage (81%) than did the rest of the population (65% for the out-of-pocket/personal insurance group and 68% for those attended by the Ministry of Social Affairs).

Finally, the vaccination status of children under 5 years old was higher for those whose mothers were older, for children of mothers who did not work outside the home, and for children whose mothers spoke and understood Dutch (related to increased coverage rates in Meursweg, but not in Pontbuiten). Lower coverages were found in children from households in which a tribal language predominated and for refugee children.

Vector-borne Diseases

In 1986, Suriname experienced a type 2 dengue epidemic, with 79 laboratory confirmed cases of dengue. From 1987 to 1990 the number of confirmed cases was 3, 5, 4, and 16, respectively. In mid-1991, the reporting of suspected cases peaked: although sentinel stations reported only 4 cases between February and May of that year, after the onset of the rainy season, 40 suspected cases were reported in June–July. From October 1992 to February 1993, 201 cases were reported; dengue types 1 and 2 have been isolated.

Malaria is one of the major public health problems in the Interior. Total numbers of cases of malaria reported to the Bureau of Public Health were 454 in 1989, 1,059 in 1990, 1,311 in 1991, and 850 in 1992. The incidence rates per 100,000 population were 114.4, 262.8, 320.5, and 204.8, respectively. The apparent increase in the incidence between 1989 and 1991 may partly be due to improved reporting associated with the gradual normalization of the situation in the Interior.

The malaria program, which had been in operation since 1957, fell apart during the war, and preventive activities were discontinued. Clinical cases were treated, but the quality of the services such as microscopy at the Medical Mission outposts deteriorated because of the breakdown of communications and transport links with the coordinating center in Paramaribo. In February 1989, malaria control activities re-

sumed in east Suriname. In the rest of the Interior no systematic preventive campaigns were carried out until April 1993, when operations resumed in Boven-Suriname Region. There were only limited campaigns in 1989, 1991, and 1992.

Schistosomiasis transmission is restricted to limited areas in the coastal zone, mainly in the district of Sarawacca, 40 km to the west of the capital city. No recent data are available for prevalence rates.

The number of reported cases of suspected leptospirosis were 24 (1 death) in 1988, 46 (5 deaths) in 1989, 78 (13 deaths) in 1990, 97 (12 deaths) in 1991, and 47 (6 deaths) in 1992. Because of a lack of laboratory confirmation in many cases, and because some suspected cases turn out to be hepatitis A or B, it is unclear whether this trend is significant or not. Most cases are confined to well-known high-risk areas in and around Paramaribo—in the neighborhoods of Munderbuiten (North Paramaribo) and Pontbuiten (South Paramaribo)—and in the district of Commewijne.

Communicable Diseases

The leading reasons for visits to polyclinics are acute respiratory infections, dermatological problems, and gastroenteritis.

Early in 1992, there was an outbreak of cholera in the southeast corner of the country, near the border with French Guiana. A total of 12 cases were reported, of which 7 were confirmed. There was no apparent further transmission of the disease.

The incidence of leprosy decreased significantly during the 1980s, to 25.8 per 100,000 population in 1989 (from 58.6 per 100,000 in 1981). This decline continued slowly in 1990, 1991, and 1992 to 15.4, 14.1, and 12.4 per 100,000, respectively.

The number of tuberculosis cases reported to the Bureau of Public Health fluctuated throughout the 1980s, without a clear downward or upward trend. Incidence rates per 100,000 population were 17.8, 11.6, and 14.5 in 1990, 1991, and 1992, respectively.

An influenza epidemic occurred in 1991, with increased reporting from sentinel stations in June, July, and August. During a 6-week period in these 3 months, more than 600 cases per week were reported, whereas the norm was below 400 per week. A total of 14,485 cases were reported in 1991, compared with 13,980 in 1990 and 12,700 in 1992.

An epidemic of shigellosis began in August 1992, and for 3 weeks, sentinel stations reported more than 15 cases of diarrhea with blood and mucus per week

(the norm was under 10 per week). Between September and December, there also were 9 weeks with more than 25 reported cases. The epidemic continued until April 1993. From August 1992 to February 1993 a total of 107 cases were hospitalized, of which 71 were confirmed; 9 of the hospitalized cases died. The epidemic was caused by a multiple resistant strain of *Shigella flexneri*. The last time a countrywide epidemic had been documented was in the 1920s.

Before 1987, many of the reported typhoid fever cases occurred among people from the Interior, but after the onset of the war the number of reported cases declined sharply. Incidence rates per 100,000 were 5.7, 5.6, and 6.4 in 1984, 1985, and 1986, respectively; in 1988–1992, the incidence rates fluctuated between 1.7 and 2.7 per 100,000, with 8, 7, 9, 7, and 11 confirmed cases for each year.

Oral Health

A survey conducted by the Youth Dental Service Foundation in 1990 found that among children 6 years old, the average DMF (decayed, missing, and filled teeth) index was 6.4. Overall, the percentage of 6-year-olds with a flawless set of teeth was 12.4%. Among 12-year-olds an average DMF of 2.7 was found, and among 15-year-olds the average DMF was 4.4.

Risk Factors

Risks in the Physical Environment

Piped drinking water is provided to 95% of the urban population. About 90% of the urban population has house connections, and an additional 5% has easy access (faucets in the yards or on public lands). Water is not chlorinated. Some coastal villages, representing about 12% of the total population, have good water supply.

About 70% of the rural population has piped water in the house, and another 20% has piped water near the house. There are 47 rural drinking water systems in the coastal area. People in the Interior rely on rivers and creeks for their water supply.

Public water supplies use groundwater. In the coastal area, saline intrusion is a major problem with water quality; in an effort to improve water quality there, the water company mixes water from wells with water piped into Paramaribo from Republiek, 40 km to the south.

Piped drinking water, pumped into the mains by the water company, exceeds WHO quality guidelines, but in many rural areas it is unsafe. Because pressure is often insufficient to supply individual household lines, people break the mains below earth level to secure water. A program to bring piped water into villages in the Interior and into rural areas was being implemented, but it has been stopped as a result of the war and the economic crisis.

All new buildings are required by law to install septic tanks for sewage disposal; these septic tanks usually drain into ditches. In Paramaribo there are two small sewage treatment plants: one, serving 50 households, has functioned without problems for more than 20 years; the other, which served about 1,000 households, fell into disrepair in the 1980s because of misuse and lack of maintenance.

There is an oxidation pond for sewage disposal of the Santo Boma state prison. About 15% of households in Paramaribo use pit latrines, and about 5% have no facilities whatsoever. In rural districts, pit latrines are the dominant form of excreta disposal.

Solid waste disposal is a major problem, in that the management of solid waste, including storage, collection, and disposal, has seriously deteriorated. Garbage is dumped in a municipal open dump site located in a swampy area in northern Paramaribo. In April 1993 there was an environmental disaster when a dam separating the swampy garbage dump from an important drainage canal was breached, and unknown toxic substances leached into the waterway, leading to a tremendous destruction of aquatic life. Because of the serious economic situation, poor garbage collection services, and a lack of awareness, garbage is dumped along roads, city streets, empty lots, canals, and rivers.

The health and environmental effects of agricultural pesticides and fertilizers, hydroelectric power plants, mining, the use of insecticides against malaria mosquitoes, and slash-and-burn agriculture are matters of concern in the Interior. There are problems with the lack of controls for the importation, distribution, and use of pesticides. For example, in agricultural areas, aerial spraying leaves pesticide and fertilizer residues on the same roofs where people collect rainwater.

Other environmental problems that have been recognized are the disposal of feces from septic tanks by sanitary trucks into the Suriname River to the south of Paramaribo; dumping of caustic soda waste in mud lakes near Paramaribo, which poses a threat to the aquifer; open mining of sand and shell-sand for construction, which turns large areas into lakes; and the

use of mercury by illegal gold-seekers along rivers in the Interior.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

General Political, Economic, and Social Policies

Upon its independence in 1975, Suriname became an independent republic with a political system modeled along the lines of Western European parliamentary democracies. Although the system was interrupted by two military coups, in 1991 elections were held and a civilian government was reinstated. The National Assembly has 51 seats and its members are elected for 5-year terms.

Administratively, the country is divided into 10 districts, which are governed by district commissioners of the Ministry of Regional Development, and each district is subdivided into "ressorts." In each of the country's 62 ressorts, a ressort council is constituted through local elections. Each district's ressort council selects representatives to form a district council.

To offset the political and economic problems of the 1980s, the Government and the population have embarked on a process of reconstruction that has three major elements—democratization of politics and government, with the population's increased participation in decision-making; the pursuit of the peace process and the concomitant development of the Interior as an integral part of national development; and the implementation of the economy's structural adjustment by restoring the productive sector, strengthening social risk groups, and promoting economic stability.

The ressort council is designed to foster the participation of local communities in government, although this goal has encountered many obstacles and there is no real consensus on how this should be achieved. Government ministries are now beginning to include ressort councils in the development of their programs, and many ressort councils are actively seeking ways to mobilize citizens through such efforts as setting up foundations, societies, and different committees to improve the health and living conditions of the population.

The Planning Bureau has proposed a joint effort with the Ministry of Regional Development to set up an organizational structure to bridge the gap between national planners and local groups.

The Government's social policy was formulated in the Ministry of Social Affairs and Housing's 1991–1996 Policy Paper. Short-term policy aims at providing material and social support for individuals and groups in vulnerable socioeconomic situations; long-term policy aims at enabling target groups to become self-sufficient.

There is an urgent need to implement social support programs to protect vulnerable groups against the structural adjustment's negative effects, but the size and exact composition of the target groups are still unknown. It is crucial for the country's research institutions to become involved in improving the availability of statistical information on target groups.

Population Policies

Suriname does not have official population and family planning policies, but the Government recognizes that family planning is important for improving the health of mothers and children. The Bureau of Public Health and the Regional Health Service are cooperating with the family planning foundation (Stichting Lobi) to promote family health and to improve collaboration among health care, education, and social services organizations. Stichting Lobi provides family planning services through the polyclinics of the Regional Health Services and the Medical Mission. The lack of detailed statistical information is a major hindrance for the development of population policies and related programs.

Health Policies and Strategies

The primary health care strategy and the goal of Health for All are the guiding principles of the country's health policies and strategies. As in other sectors of society, the major problem that must be solved is the shortage of trained managers. Improvement of management at all levels in the health care sector is a top priority.

Organization and Administration of the Sector's Institutions. The proliferation of administrative, political, and social demographic catchment areas is a problem. Even health sector agencies have several different configurations of catchment areas, making it impossible to correlate data for different areas of the country.

An important organizational policy is strengthening the management of the hospitals, which consume

more than 50% of the national health budget. Already-expensive hospital service costs are rising fast because of inflation, wage increases, a lack of cost-control mechanisms, and the inefficient use of hospital beds. In 1992, hospital health care costs were Sf 125 million per year (4.2% of GDP). Devaluation of the country's currency will lead to even higher costs.

The integration of hospitals into the overall health care delivery system is being contemplated, and the specific roles and functions of each hospital are being defined, because it is felt that hospitals must become part of the national primary health care strategy.

Policy measures are aimed at giving more autonomy to institutions and at the same time strengthening the Ministry of Health's coordinating role.

Human Resources. Human resource development has been given very high priority. Plans have been drawn up for new training programs to teach health workers skills in planning, organizing, communications, supervision, interpersonal relations, organizational dynamics, and financial management. In 1992–1993, the University of Suriname introduced a new public health curriculum to strengthen the primary health care outlook of medical students.

All training institutions are preparing new training programs aimed at primary health care strategies. These include COVAB (the Central School of Nursing), the Youth Dental Services, and the intramural training programs (in the hospitals).

Financing and Budgeting Policies. Hospitals are working on a standardized system of financial calculations and bookkeeping, in order to make it possible to compare data between hospitals and to facilitate efforts to increase efficiency.

The official policy seeks to expand the population covered by the State Health Insurance Foundation to include persons currently receiving free medical care through an arrangement with the Ministry of Social Affairs. The State Health Insurance Foundation is working to improve premiums and tariff structures and also is looking into ways in which it could contribute to the budgeting of health care through a more equitable reimbursement schedule for curative and preventive services.

Physical Resources. Several projects within the technical cooperation program between Suriname and the Kingdom of the Netherlands target the rehabilitation of the physical infrastructure of hospitals and health centers (including those in the Interior). Critical

medical equipment investments were undertaken in 1992–1993.

Food and Nutrition. The major policy thrust in this regard is the establishment of a nutritional surveillance program by the Bureau of Public Health, in cooperation with the Ministry of Agriculture, the Ministry of Social Affairs, and several NGOs. The establishment of an intersectoral nutrition council is an important element of this policy.

Drugs and Immunobiological Products. Utilizing funds from the development assistance treaty with the Kingdom of the Netherlands, a program for the supply of medical equipment and supplies is being developed and implemented (1992–1995). The quality control and local production of drugs are being upgraded, and the country has developed a national formulary. Standard lists are being assembled for different categories of supplies.

Special Diagnostic and Treatment Resources. The country has an arrangement with the Kingdom of the Netherlands for sending patients there for medical procedures that cannot be performed in Suriname. National policy is to decrease the need for sending patients abroad by setting up better facilities in Paramaribo. The State Health Insurance Foundation has paid an average of US\$ 13,900 per case, and the number of cases could easily rise above 200 per year.

Drinking Water and Sanitation. With funds from the above-mentioned treaty, the following policies and strategies are being implemented: institutional strengthening of the Suriname Water Company and the Ministry of Natural Resources and Energy; integration of these two agencies; expansion and improvement of drinking water supply by the Suriname Water Company; expansion and improvement of the Ministry of Natural Resources and Energy's rural water supply systems; adjustment of tariffs, combined with measures to contain costs of production and distribution; and establishment of a Water Authority to safeguard the long-term availability of drinking water against dangers.

In terms of sanitation, important government policies involve privatization of the garbage collection service and the establishment of sanitary landfills.

Health Legislation. Health legislation in Suriname is outdated and complicated. Consequently, updating health legislation is one of the Government's priorities,

especially regarding tariffs, the regulation of hospital operations, relations with trade unions, institutionalization for behavioral disorders, the reporting of communicable diseases such as AIDS and HIV infection, and regulation of pesticide use.

Priority Programs. The integration of community health services and hospitals is a major priority, as are programs aimed at the poor, women and children, refugees, the elderly, the handicapped, and the chronically ill. Health education and health promotion also are actively pursued. In addition, the development of health and management information systems is ongoing, and new forms for reporting deaths have been designed and are being implemented.

Organization of Services

Personal Health Care Services

The Ministry of Health is responsible for coordinating the national health care system. Research into structural trends and the elaboration of management policies for the system are under the responsibility of a planning unit and the inspectorates. The Bureau of Public Health—which has approximately 550 workers, 20 of whom have university degrees—coordinates preventive health care; it also supervises and executes programs that provide information on the distribution of diseases and operates disease control programs against malaria, yellow fever, dengue, and schistosomiasis. The epidemiology unit operates a surveillance system on communicable diseases in close cooperation with the Regional Health Service; this system relies on weekly reports from 27 sentinel stations. The Bureau has two special departments, the Central Public Health Laboratory and the Medical Education Bureau, which handles programs aimed at children with developmental retardation and learning problems.

Several institutions affiliated with the Ministry of Health, including the Academic Hospital, the 's Lands Hospital, and the State Health Insurance Foundation, report directly to the Minister of Health, bypassing the Directors of the Bureau of Public Health and the Regional Health Service. This setup sometimes creates managerial problems in planning, budgeting, and monitoring.

There are four financing categories in health care. The first involves free care for the poor, which is financed through the Ministry of Social Affairs. In 1992, about 105,000 persons were covered through this pro-

vision, which is targeted at persons who earn less than Sf 500 per month. Services of general practitioners and specialists, medication, and hospitalization are covered. The second encompasses subsidized health insurance for government workers through the State Health Insurance Foundation, which covers about 147,440 persons from 54,607 households. In 1993, the State Health Insurance Foundation had contracts with 93 medical specialists, 134 general practitioners, 19 pharmacies, 3 clinical chemists, and 5 hospitals. The third provides free health care for people in the Interior, and is administered through the Medical Mission, which is financed by the Ministry of Health. Finally, there is privately financed health care, either out-of-pocket or through private (individual) and company (collective) insurance policies. Between 8% and 18% of the population must pay out-of-pocket for medical care.

In 1993, the country had 6 referral hospitals (4 public, 2 private), 3 district hospitals (all public), 16 health centers (11 public), 65 basic polyclinics (37 private), and 49 health posts (all public).

The Regional Health Service was established in 1980, and was charged with implementing integral, primary health care services for the poor along a 400-km long and 50-km deep, flat coastal plain. It covers about 105,000 people holding a special card issued by the Ministry of Social Affairs and roughly another 40,000 people who are covered by the State Health Insurance Foundation. The Service offers free preventive services to all the country's inhabitants who come to the clinics, including immunizations, counseling, planning services in cooperation with Stichting Lobi, and dental services for schools in cooperation with the Youth Dental Service.

The Regional Health Service operates nine health centers offering medical, pharmaceutical, and laboratory services and clinics for children under age 5, some with a few hospital beds for emergencies; 29 basic polyclinics, offering medical and pharmaceutical services and clinics for children under age 5; and 45 auxiliary posts located in villages in the districts and operated by visiting doctors and nurses on a few days per month.

The Service has 41 doctors, 17 assistant-physicians, 1 pharmacist, 48 nurses, 59 nursing auxiliaries, 28 nursing-assistants, 39 pharmacy assistants (including administrative assistants), 10 laboratory technicians, 15 trained midwives, and about 250 people in administrative and supporting positions.

The Medical Mission provides medical services in the Interior. It functions as an umbrella for the medical

work of three religious foundations, and operates 44 polyclinics that are staffed by health assistants recruited from the local population. In a 3–4-year training program, they learn to recognize and treat common health problems and acquire skills to assist uncomplicated deliveries. They also learn about the prevention of specific diseases and the promotion of healthy lifestyles. In 1992, the Medical Mission had 164 employees, 20 of whom were working at the center in Paramaribo; these included 4 doctors, 5 nurses, and 53 nursing auxiliaries. The Medical Mission has 100 beds available in the Diakonessenhuis (the Protestant hospital).

There are six hospitals in Paramaribo (four government and two privately owned) and one in Nickerie (government). In the Interior there are two small hospitals: one in Djoemoe with 25 beds and one in Stoelmanseiland (near French Guiana) with 40 beds. The hospital in Albina (in the north on the border with French Guiana) was destroyed during the war.

The total number of general hospital beds in use in January 1993 was 1,323 (3.1 hospital beds in use per 1,000 population), plus another 300 beds in the psychiatric hospital. Government hospitals account for 823 beds (410 in Academic Hospital, 50 in Dependence Academic hospital for the chronically ill, 303 in 's Lands Hospital, and 60 in Nickerie) and privately owned facilities account for 500 (220 in Diakonessenhuis, the Protestant hospital, and 280 in St. Vincentius Hospital, the Roman Catholic hospital).

The four major hospitals in Paramaribo deal with four basic medical disciplines: surgery, internal medicine, gynecology, and pediatrics. In 1989, the occupancy rate was 74% and the average length of stay was 12.0 days for the Academic Hospital; 70% and 10.9 days for St. Vincentius Hospital; 69% and 9.8 days for Diakonessenhuis Hospital; and 60% and 7.5 days for the 's Lands Hospital. The combined occupancy rate for the four major hospitals in Paramaribo was 62%.

The Academic Hospital draws patients from throughout the coastal area, which has a population of about 350,000; patients are admitted after referral by general practitioners. It is the only hospital that has a department for emergency medicine; in 1992, about 50,000 patients were seen at the emergency department. About 40% of them were classified as patients with nonemergency types of complaints. In 1992 about 1,000 babies were born in this hospital.

Dependence Academic Hospital has 50 beds for chronically ill patients. In April 1993, the hospital had 61 physicians (40 specialists), 155 registered nurses, 77 nursing auxiliaries and assistants, 29 midwives,

21 pharmacy personnel, 50 laboratory personnel, 22 X-ray technicians, 1 nutritionist, 3 physiotherapists, and 450 administrative, technical, and general support personnel.

Almost one-half of all babies in the country are born in 's Lands Hospital (approximately 4,500 in 1992). The Hospital offers maternal and child care, prenatal services, and Pap tests, which are performed in cooperation with Stichting Lobi; renal dialyses also are performed there. There also is a training program for midwives, with about 10 to 15 students admitted each year; students are registered nurses, and the course lasts 3 years. In April 1993, the Hospital had 12 physicians (10 specialists), 80 registered nurses, 125 nursing auxiliaries and assistants, 23 midwives, 25 pharmacy personnel, 22 laboratory personnel, 5 X-ray technicians, 1 nutritionist, 1 physiotherapist, and 250 administrative, technical, and general support personnel.

Daikonessenhuis Hospital reserves 100 of its 220 beds for Medical Mission patients; it is the only hospital in the country that operates with a primary health care approach. Although in 1985 about 600 patients from the Interior were admitted, in 1989, the number was only 60 because of the war in the Interior. Approximately 1,350 babies were born in this hospital in 1992. In April 1993 the Hospital had 18 physicians (14 specialists), 92 registered nurses, 68 nursing auxiliaries and assistants, 7 midwives, 21 pharmacy personnel, 18 laboratory personnel, 9 X-ray technicians, and 1 nutritionist.

Approximately 1,300 babies were born in St. Vincentius Hospital in 1992. In 1989, personnel shortages forced the hospital to close an internal medicine ward and the intensive care unit. In April 1993 it had 16 physicians, all of them specialists.

Nickerie Hospital, the regional hospital in Nickerie district, has an operating room, an obstetrics department, an X-ray facility, and a medical laboratory. In April 1993, the Hospital had 4 physicians (2 specialists); 6 registered nurses; 30 nursing auxiliaries and assistants; 1 midwife; 24 pharmacy personnel; 6 laboratory personnel; 2 X-ray technicians; and 45 administrative, technical, and general support personnel.

The 's Lands Psychiatric Hospital, which was established in 1885, had a 300-bed capacity in 1990, with 770 readmissions a year. There were 20,000 outpatient visits, around 100 per day. In April 1993, staff included 4 psychiatrists, 3 general physicians, 140 registered nurses, 40 nursing auxiliaries, and 110 other personnel.

The major problems regarding mental health care in the country have to do with the fact that there are no community-based services for the mentally ill; ambu-

latory outreach also is very limited. About 60% of in-patients are over 65 years old and have been hospitalized for more than 30 years. There is a ward for crisis intervention (short-stay patients), a ward for forensic psychiatry, and a pavilion for psychogeriatric and chronic patients.

Expenditures on the six referral hospitals in 1990 represented 51% of total national expenditure on health in that year.

A separate dermatology service provides curative and preventive services in sexually transmitted diseases, leprosy control, and the treatment of dermatological problems. Three dermatologists work in the service, and they also provide consultative services to hospitals.

Dentistry services are mainly provided by private dentists; in April 1993 there were 29 dentists country-wide. The Youth Dental Service, which has outreach programs aimed at schoolchildren, employs 3 dentists and 57 dental hygienists.

The Red Cross Society provides blood transfusion services and manages the country's only blood bank.

Private general practitioners are important providers of personal health care services. As of April 1993, all 87 private doctors, the 41 doctors in the Regional Health Service, and the 6 doctors in the Bureau of Public Health had contracts with the State Health Insurance Foundation. The Foundation also had contracts with almost all medical specialists (93), all private pharmacies (19), and three clinical chemistry specialists.

According to the 1992 Warwick Report, the country has a relatively well-developed social support system through several government ministries, including cash transfers to the elderly (60 years old and older) and to poor families, child allowances, direct income support for refugees, free medical care for the poor, government payments of premiums for the coverage of government workers and their families by the State Health Insurance Foundation, free education, and subsidies for food, housing, and utilities. The Government also has several other support programs, and aid is also provided by NGOs.

The system of subsidized packages of commodities was set up in 1986 to ensure the availability of essential foods; 130,000 persons receive these parcels. This policy also aimed at stabilizing prices and ensuring the equitable distribution of limited essential goods. Beyond the economic benefit, this policy also guarantees a basic level of nutritional status.

The Ministry of Social Affairs has found that the cash transfers to the elderly and the poor are not suffi-

cient to cover the continuously rising costs of living, even though these payments have increased, in some cases doubling, in recent years. According to the Warwick Report, the effects of the social support systems are limited because they are spread out over too many recipients. The Ministry of Social Affairs estimates that about 30% of all persons receiving free medical care are not really eligible. The effect of aid on the purchasing power of the poor is not known because there are no household budget surveys.

Environmental Services

The major problems in recent years were lack of adequate maintenance and the inability to increase the water supply, unrealistic tariffs that do not reflect the real costs, and lack of trained personnel.

The country's drinking water supply is provided by two organizations, the Suriname Water Company and the Ministry of National Resources and Energy. The former covers Paramaribo and parts of Wanica, Nieuw Nickerie, and Albina, and also serves a 500-m strip on both sides of the 50-km road connecting Paramaribo and the International Airport in Zandery. Excluding Nickerie and Albina, the Water Company served 51,408 metered customers (households and industries) as of March 1993. In 1989-1990, 90.7% of Paramaribo addresses were served by the Water Company and 3% by the Ministry; in Wanica 36.9% of addresses were served by the Water Company and 37.5% by the Ministry. According to the Water Company's figures, 6% of households in Paramaribo have other arrangements; in Wanica the figure is 25.5%. It has been estimated that the Water Company covered 229,500 people in 1989, but coverage is difficult to measure because of inadequate demographic data; in Nickerie the Water Company has about 2,500 customers, covering roughly 15,000 people. The water supply does not keep up with increasing demands, and in many areas, water is available only during certain hours of the day. In Paramaribo the Water Company has noted an increase in water use since the war broke out in the Interior.

There are many governmental and nongovernmental institutions and organizations that are active in environmental protection, including the Ministry of Natural Resources, the Ministry of Agriculture, the Ministry of Health, the University of Suriname, the Ministry of Public Works, and NGOs such as Stichting Schoon Suriname (Foundation for a Clean Suriname).

Available Resources

Human Resources

The number of available health care professionals declined by 5% in 1985–1990. After 1990, the exodus of trained nurses and laboratory and medical equipment technicians increased. From January to July 1993, a total of 23 registered nurses left.

The health sector employs approximately 5,100 people directly, including administrative and other support personnel. Of these, 70% are employed by the Government. About 67% of health care workers (excluding administrative, logistical, and other support personnel) are employed by the nine hospitals.

Between 1969 and 1987, 173 medical doctors graduated from the University, 43 from 1983 to 1987. As of April 1993, 340 students were enrolled. In recent years, the numbers of physicians graduating from the medical school were four in 1989, six in 1990, nine in 1991, and seven in 1992; the duration of the curriculum is 7 years.

The Central School of Nursing and the intramural training programs of the Academic Hospital and St. Vincentius Hospital are training students to become registered nurses and nursing auxiliaries. The duration of the courses is 4 years for registered nurses and 3 years for auxiliaries. Midwives are trained at 's Lands Hospital.

The Youth Dental Service trains dental hygienists,

and the Bureau of Public Health has a training program for environmental inspectors. As stated before, the Medical Mission has a special training program for village health workers.

Financial Resources

An analysis of government expenditures for 1983–1987 shows that the Ministry of Health had a consistent proportion of 5% of total yearly government expenditures. In 1991, that percentage amounted to US\$ 28,333,000 total expenditures (at the official rate of exchange); more than half of these expenditures were for personnel costs. Other general costs accounted for 25% of Ministry of Health expenditures.

Total national expenditures on health care (government and private expenditures combined) were estimated at US\$ 89,643,000 in 1990. This was 5.7% of the GNP. Of this amount, at least 63% (Sf 56,634,000) was financed by the Government. The distribution of government expenditures was: Ministry of Health, 44.7%; Ministry of Social Affairs, 17.4%; Ministry of Finance (payments to State Health Insurance), 35.9%; and Ministry of Education (Institute for Biomedical Sciences), 2.0%.

Included among private sector expenditures are US\$ 4.97 million spent by the bauxite company SURALCO on health care for employees.

TRINIDAD AND TOBAGO

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

Trinidad and Tobago is a twin-island State situated at the southern end of the Caribbean chain of islands. It is a democratic republic within the British Commonwealth. The contraction of the national economy has been sharp, and high unemployment has persisted since 1982.

Real gross domestic product (GDP) fell by one-third and nominal gross national product (GNP) fell from US\$ 7,226 to US\$ 3,246 between 1982 and 1989. Government's revenue, dependent upon the petroleum sector, diminished quickly. In order to offset these stringencies, the Government has instituted a program of trade reform and currency liberalization that had a direct impact on the economic well-being of the people. Health and social services received smaller allocations between 1982 and 1990, which resulted in a decrease of 54% in the real value of the resources allocated to the health sector.

Adjustment measures taken included devaluation of the Trinidad and Tobago dollar in 1985 and 1988, and more recently (in April 1993) the floating of the dollar, the immediate effect of which has been a further devaluation. A 15% value-added tax was introduced in 1990, but some basic food items and prescription drugs were exempted. Increases in the price of gasoline and the cost of public utilities, including water rates, have completed the picture of rises in the cost of living. In 1992 growth in the real GDP was revised downward to 0.2%, while consumer prices were estimated to have risen by 8%. The underlying rate of inflation in 1992 is estimated to have been 3.5% to 4.9%. The consequences have been felt most severely by those at or near the poverty line, especially the vulnerable groups of children and the elderly, as the social safety net has been unable to protect them adequately.

Nevertheless, the community health infrastructure has shown resilience. Developed over the last four

decades, it emphasizes prevention and health maintenance. The secondary and tertiary health services have been more seriously affected by the reduction in both quantity and quality of care for some severely ill patients.

In 1991 a pilot survey of living conditions in a sample population delineated by household expenditure was conducted by the Social Sector Planning Unit, Ministry of Planning and Development, and the Ministry of Consumer Affairs and Social Services. It showed that female-headed households made up 36.4% of the households in the lowest expenditure quintile of the survey, in comparison to only 11.4% of households in the highest quintile. The poorest 20% of households had an average monthly expenditure of US\$ 96.31. According to 1988 figures, this amount would not support a three-member household above the poverty line, which at the time was calculated at US\$ 188.23 per month for a three-member household. In 1988, 18.7% of households sampled were below the poverty line.

The decrease in the purchasing value of the dollar is illustrated by the rise of the index of retail food prices by 110 points since 1989. According to the survey, households in the lowest expenditure quintile spend about 50% of their money on food each month—about US\$ 48.23 in 1993, reduced from US\$ 121.88 in 1988.

Nationally, the survey confirmed that 96% of children 5–15 years of age attend school; however, in the lowest quintile, only 85% of children attend. In this group more girls than boys do not attend, and 43% of this group do not have textbooks. Fifty-three percent of the survey children attend schools where meals are provided. All the children from the lowest quintile with access to these schools receive the meal.

The survey revealed that the economically disadvantaged group is handicapped by both limited food intake and irregular attendance at school, factors that have an adverse impact on future health status.

Slightly more boys than girls attend primary school. On admission to secondary school the numbers vary in favor of boys by only 0.09%, but by 16 years of age the number of girls exceeds that of boys. In the "prestige"

schools, this trend is not seen until the pre-university year (the year in which university entrance examinations are taken), when more girls than boys go on to university.

In 1991, of the total labor force (492,100), 18.5% was unemployed. For women the unemployment rate was 23%, compared to 15.7% for men. Of young persons 15–19 years old in the labor force, 43.2% were unemployed, and those who had attended secondary school but not obtained qualifications were least likely to be employed.

Population

The estimated mid-year population in 1990 was 1,227,443, an increase of 14.3% for the period 1980–1990. The increase would have been greater, but for the outward migration during this period, which peaked in 1988 at 44,222 and totaled 131,918 from 1980 to 1990. Many health professionals were among those who left the country.

The population distribution in 1990 shows a decrease of 10% in those under 15 years and an increase of 1.3% in those over 65 years. The male-to-female ratio in 1990 was 114:100. The overall age distribution in 1990 was 31.3% for the age group 0–14 years, 17.5% for 15–24, 31.0% for 25–44, 14.8% for 45–64, and 5.5% for 65 and over.

According to preliminary figures from the 1990 census, areas of the country where population has increased much more than the national average are Caroni (+25.33%), County Saint Andrew/Saint David (+23.57%), and Tobago (+23.41%). These areas have had no obvious improved employment opportunities, and it seems that the search for housing rather than employment is the dominant factor in the level and pattern of internal migration.

Life expectancy at birth in 1991 was 72.8 for females and 71.6 for males.

The 1980 census showed that the ethnic distribution of the population was almost equally African and East Indian, 41.0% and 40.8%, respectively; 16.4% of the population was classified as mixed; 0.9%, European; and 0.9%, "other." Breakdown by age group in 1980 showed higher percentages of persons of East Indian origin in the group 5–44 years.

The birth rate fell from 22.3 per 1,000 in 1988 to 18.1 per 1,000 in 1991; the actual number of births was 22,368. The general fertility rate fell from 91.03 in 1988 to 73.49 in 1991. The greatest number of live births

were to mothers 20–29 years old (56.9% of all births). Births to teenagers accounted for 13.8% and to mothers over 35 years, 11.3%. Mothers in the age group 15–24 years accounted for almost 70% of first births.

Crude death rates have stabilized at 6.6 per 1,000, with 41.8% of deaths occurring in the age group 50–74 years. The official infant mortality rate maintained a steady downward trend from 1980 to 1991, falling to 11.0 per 1,000 live births. The maternal mortality rate has also decreased, to 4.9 per 10,000 live births in 1991. However, these rates have not been corroborated by the findings of two independent surveys, which found infant mortality rates to be higher than those estimated on the basis of registration of births and deaths.

Mortality and Morbidity

Mortality and morbidity trends show chronic diseases, rather than the communicable and nutritional deficiency diseases, as major causes of ill health. Exceptions are the sexually transmitted diseases, AIDS, and anemia. The main causes of death in 1990 for all ages were ischemic heart disease (ICD-9, 410–414), 16.5% of all deaths; cancer (140–239), 12.8%; diabetes mellitus (250), 12%; cerebrovascular disease (430–438), 11.4%; and hypertension (401–405), 3.9%. These patterns are mirrored in morbidity data from health centers and hospitals, where hypertension, diabetes, skin diseases, mental illness, and substance abuse are among the leading causes of visits. Accidents and violence (including suicides) (E800–E999) are the leading cause of death in the age group 15–44 years and account for 8% of all deaths. The same five leading causes of death are found in each county, except Tobago, but they vary in rank according to the percentage of Afro-Trinidadians or Indo-Trinidadians in the population. For example, in counties in which a high percentage of the population is of Indian origin, diabetes ranks before cancer.

In 1989, symptoms and ill-defined conditions accounted for 2.3% of total deaths in Trinidad and Tobago. Although all deaths are certified by a medical practitioner, caution should be exercised in interpreting specific cause of death data owing to limited access to and use of diagnostic facilities to confirm clinical diagnoses, especially for the 65+ age group and the chronically ill. Autopsy rates are also very low, particularly in the above-mentioned age group and for deaths occurring at home. Underregistration of deaths is not a significant problem in Trinidad and Tobago.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

In contrast to survey findings¹ of around 27 per 1,000 live births (1989), official rates for infant mortality were reported at 12.7 per 1,000 live births in 1990 and 11.0 in 1991. Of deaths among infants under 1 year in 1990, 25% occurred at under 1 day of age, 55% occurred at under 7 days of age, and a total of 70% were age 28 days or less. Stillbirths made up 65% of the reported perinatal deaths. Babies born to women 25 to 29 years old are most likely to survive the first year of life.

Infant deaths in the postneonatal period are caused most frequently by congenital anomalies (ICD-9, 740–759), pneumonia (480–487), accidents (E800–E929), and intestinal infections (001–009). The same conditions were the main causes of the 87 deaths in 1990 of children 1–4 years. There has been a dramatic decline in deaths from gastroenteritis among infants and children aged 1–4 years, but the increase in deaths from accidents is alarming. These mortality statistics are reinforced by those for morbidity, based on hospital discharges and visits to health centers. In the former statistics, external injuries and poisoning rank first in the 1–4-year age group.

Skin disease and respiratory diseases have replaced diarrheal disease as the most frequent causes for health care visits among children aged 1–4 years. Hospital admissions for malnutrition in children have been increasing since 1987. The prevalence of undernutrition based on routine weighing at child health clinics is reported as 3.8% for mild undernourishment and 0.5% for severe undernourishment. However, in areas where malnutrition is present, the prevalence ranged from 4.3% to 23.5% malnourished.

Since 1983, of 79 children under 15 years diagnosed with AIDS, 50 (63.3%) were less than 1 year old at the time of diagnosis. In a study of 21 HIV-positive children, all the mothers, as well as those fathers tested, were also HIV-positive. Fourteen of the 21 children died within the study period of 3 years. In 1990 there were seven deaths from AIDS in children under age 15, two of whom were under 1 year old.

Recent figures collected by concerned organizations and social workers have revealed an increasing num-

ber of cases of child abuse. Abused children presented more frequently with behavioral disorders (39.5%) compared with those not abused (13.7%). Sexual abuse combined with physical abuse was common. One study reported that teenaged mothers were often the survivors of abuse in childhood, and that in nearly 40% of these cases, their mothers had been teenaged mothers, of whom 20% had also been abused as children, particularly between the ages of 5 and 14 years.

Adolescent and Adult Health

In the group 15–59 years of age, morbidity and mortality are dominated by accidents, mental illness, sexually transmitted diseases, AIDS, diabetes mellitus, hypertension, and ischemic heart disease.

Health of Women

In 1990, 16.3% of a total of 3,769 deaths among women were due to ischemic heart disease (ICD-9, 410–414), 13.9% to diabetes mellitus (250), 12.9% to neoplasms (140–239), 12.6% to cerebrovascular disease (430–438), 3.7% to hypertension (401–405), and 0.3% to obstetrical causes (630–676). Age-adjusted prevalence rates for obesity, hypertension, and diabetes mellitus were 28%, 27%, and 12%, respectively. Cancer of the breast and cervix uteri, in that order, are the two leading causes of cancer deaths in women. Reproductive tract infections are a frequent cause of morbidity and infertility.

More women than men are admitted to psychiatric hospitals. Causes of admission are organic psychoses, affective psychoses, neurotic disorders, and personality disorders. Hospital admissions for attempted suicides showed a preponderance of female patients, of whom East Indian women 15–29 years old made up the greatest number.

Increasing numbers of women earn their living in a hazardous manner as roadside vendors.

Women diagnosed with AIDS constitute 25.5% of all adult cases. Incidence rates for AIDS in women aged 15–19 years doubled between 1989 and 1990.

Health of the Elderly

Some 5.5% of the population (67,569 persons) are over the age of 64 years, but this age group accounts

¹Infant mortality survey by Kenneth Heath, 1990.

for 15% of all health center visits. Like the rest of the adult population, they exhibit the prevalent chronic diseases that are the most common causes of death. Accidents contributed 7.1% of the 4,721 deaths in this age group in 1990, most taking place in the home. Only 0.44% of all deaths in this age group (including those ill-defined) are due to motor vehicle accidents.

Workers' Health

Statistics for occupational diseases are not available. Studies on lead and pesticide exposure show varying degrees of intoxication due to poor compliance with safety measures.

Health of Special Groups

It was estimated in 1992 by the Ministry of Consumer Affairs and Social Services that 6.8% of the population in Trinidad and Tobago has some type of disability. Many of these people have no special care and remain handicapped for life. A survey in 1981 found a prevalence rate of disability in children of over 10%, which includes emotional disturbances. Hearing disability affected 4.6%, speech and language disability 4.1%, physical disability 1.7%, and visual difficulty 0.7%.

It was estimated in 1992 that 402 homeless people roam the streets of cities, towns, and villages, 258 of whom are in Port of Spain.

Diseases and Health Impairments

Vector-borne Diseases

In 1991, after the disease had been absent for 25 years, one imported case of *Plasmodium vivax* malaria was the source for infection of another nine persons in a village on the southwestern peninsula of Trinidad, most likely through transmission by *Anopheles aquasalis*. Six imported cases of malaria were identified in 1992 and two cases of local origin, one from the area of the 1991 focus.

Dengue virus types 1, 2, and 4 are endemic and have been isolated regularly from febrile patients since 1981. One case of dengue shock syndrome was diagnosed in 1992, but there have been no confirmed cases of dengue hemorrhagic fever. Reported clinical cases of dengue numbered 238 in 1991 and 642 in 1992.

Human cases of yellow fever have not occurred since the outbreak (18 cases) in 1979 due to sylvatic transmission.

Cases of Chagas' disease have not been detected since the survey of 1981, when 12 cases showed evidence of *Trypanosoma cruzi* infection. However, recent evidence of transmission by *Panstrongylus megistus* to dogs, agouti, and opossums has led to examination of the blood of hunters for antibodies to the trypanosome. One hundred hunters in south Trinidad who were seropositive also exhibited cardiac symptoms consistent with Chagas' disease.

A widespread outbreak of scabies due to *Sarcoptes scabiei*, affecting all age groups, commenced in 1982 and has continued. Cases reported between 1988 and 1991 number 8,439, 9,154, 16,201, and 15,650, respectively. There were 13,356 cases in 1992, for a rate of 1,066.6 per 100,000 population.

Vaccine-preventable Diseases

In the period 1988–1992 there were two laboratory-confirmed cases of diphtheria. Pertussis rates remained below 1 per 100,000 population, and there were no cases of poliomyelitis. Notified cases of measles fell from 2,170 in 1989 to 117 in 1992, the lowest incidence (9.3 per 100,000) in over 10 years. Tetanus rates per 100,000 varied from 0.5 to 0.9, an average of seven cases occurring per year. All three deaths from this cause in 1990 were in persons over 55 years old. Beginning in late 1992 and continuing into 1993, an increasing incidence of mumps has been noted.

Cholera and Other Intestinal Infectious Diseases

In general, rates of gastroenteritis, typhoid, and foodborne illness showed little change in the 5 years ending in 1991. To date no cases of cholera have been reported. Surveillance of diarrheal diseases has been intensified, which may account for an apparent increase in the number of cases. In 1992, an outbreak of *Salmonella typhimurium* food poisoning at the psychiatric hospital resulted in 326 cases and 10 deaths. A drink containing raw eggs was incriminated as the vehicle of transmission.

In 1990 gastroenteritis caused 4 (1.3%) of 307 infant deaths and 4 (4.6%) of 87 deaths in the age group 1–4 years. Diarrheal diseases account for only 1.2% of visits to child health clinics.

Chronic Communicable Diseases

The incidence of notified cases of pulmonary tuberculosis has steadily increased from 5.7 per 100,000 in 1982 to 11.3 per 100,000 in 1992. This rise is most marked among males 25–34 years and suggests a link with HIV infection.

At the end of 1991, 117 patients with Hansen's disease were under active surveillance or treatment. Of the 22 new patients added in 1991, 5 were under 14 years of age. The prevalence rate is 5.7 per 100,000 population and shows a persistent but slow downward trend.

Outbreaks of hepatitis A have occurred, mainly in areas where housing and sanitary conditions are unsatisfactory. Clinically diagnosed viral hepatitis (A and B) had incidence rates as high as 52.5 per 100,000 in 1989 and as low as 13.3 in 1992. Laboratory diagnosis of hepatitis B showed less variation, with just over 100 positive cases being identified per year.

Respiratory Diseases

Influenza is the most common communicable disease. A brisk outbreak occurred in 1990, during which reported cases reached 43,741 (3,543.5 per 100,000). Five deaths were recorded, all in persons over 80 years old.

Rabies and Other Zoonoses

Rabies in domestic animals has not been reported.

Leptospirosis has continued at endemic levels in the local population. From 1984 to 1987, the number of clinically diagnosed cases ranged between 24 and 47, with rates per 100,000 population between 2.0 and 4.0. The number of cases increased to 76 in 1988, 107 in 1989, 69 in 1990, 79 in 1991, and 101 in 1992; as of 26 June, 51 cases had been reported in 1993. The rates for 1988–1992 were 6.2, 8.3, 5.6, 6.4, and 8.1, respectively. The number of laboratory-confirmed cases ranged between 30 and 85 during the period 1988–1992.

AIDS and Other Sexually Transmitted Diseases

As of 31 March 1993, 1,277 confirmed cases of AIDS had been notified since 1983; of these, 821 have died, giving a case fatality rate of 64.29%. In 1992, annual incidence rates sharply increased to 20.5 cases per

100,000 population, and mortality rates reached 13.1 per 100,000 population. Between 1984 and June 1992, 2,474 persons tested positive for HIV antibody, yielding a seroprevalence rate of 46.8 per 100,000 population. At the end of 1992, 91 cases (7.4% of all cases) had been diagnosed in children under 15 years of age, of whom 63.7% were less than 1 year of age. An increasing trend is seen in the proportion of cases due to heterosexual contact.

In 1990, AIDS was the third ranking cause of death for males aged 15–24 years and the second ranking cause for males aged 25–34 years. During the same year, AIDS was responsible for 6.6% of female deaths (17 of 256) in the five principal mortality categories.

In 1991, almost half (49.3%) of 7,929 applicants for medical attention at special clinics for sexually transmitted diseases had a positive diagnosis. The distribution of sexually transmitted diseases within the positive group remained fairly constant in 1991: gonorrhea, 60%; syphilis, 15.6%; and genital herpes, 11.2%. Of applications for VDRL blood testing, about 6% to 7% yielded positive results. Among women tested during prenatal care, about 1% had a positive VDRL. National rates for gonorrhea and syphilis are 233 per 100,000 population and 72 per 100,000, respectively. The statistics from the island of Tobago are remarkably low, with rates for gonorrhea of 18 per 100,000 and for syphilis of 20 per 100,000 (1991).

More than half the reported cases of gonorrhea, early syphilis, and genital herpes occur in the age group 15–29 years. The ratio of males to females with gonorrhea is 2.8:1.

Nutritional and Metabolic Diseases and Deficiencies

Obesity (weight-for-height at least 20% greater than the ideal) remains a major problem, with a prevalence of 28% in adults.

Low birthweight affected 13.5% of infants delivered at one maternity hospital in 1988, continuing an increasing trend since 1984. A survey in 1989 reported 18% of live births to weigh less than 2,500 g. In 1990, 14.9% of pregnant women were found to be mildly anemic (hemoglobin 10.0 to 10.9 g/dl) and 2.3% had hemoglobin levels of less than 8.0 g/dl. At the health centers 16.8% of women receiving prenatal care were found to have a hemoglobin level lower than 10 g/dl. Although 89% of infants are breast-fed, by 3 months most mothers had introduced supplemental foods and by 6 months 50% had ceased breastfeeding.

A nutrition survey of 3,735 primary school entrants conducted in 1989 discovered the following: 7.1% of the children were undernourished (two standard deviations or more below the median of the reference population) based on weight-for-height; 2.7% were undernourished based on height-for-age; and 6.3% were obese. An anemia study on the same children (4–6 years old) found that 9.4% suffered from moderate to severe anemia and 24% were mildly anemic.

Age-specific mortality rates for adults 24–75 years old for hypertension, coronary heart disease, and diabetes mellitus are high. In particular, proportional mortality from diabetes has increased from 5% in 1960 to 12.6% in 1990 (80.5 per 100,000). In the Saint James Survey (a population-based survey conducted during 1977–1981), diabetes mellitus, which is commonly adult-onset, was diagnosed in 15% of women and 12% of men aged 35–69 years, with a higher prevalence in people of East Indian descent compared to those of African descent. While diabetes ranks lower than abortion, external injuries, and respiratory diseases as a cause for hospitalization at general hospitals, it is responsible for a greater proportion of occupied beds. Diabetic patients also account for about 9% of first visits to health centers by persons 5 years and over.

Cardiovascular Diseases

Heart disease (ICD-9, 390–398 and 410–429) is the highest ranking cause of death, accounting for 25% of all deaths. Heart disease is the second ranking cause of death in males in the age group 15–44 years (24.6 per 100,000 in 1987) and the third cause in females 15–44 years (15.5 per 100,000 population). Rates of death due to hypertension have remained constant at 28 per 100,000 population since 1984, in contrast to ischemic heart disease rates, which increased from 106 to 116 per 100,000 (1989). The highest number of these latter deaths in males occur in the age group 55–74 years, but in females the greatest number occur between age 65 and 84 years.

The mortality rates from cerebrovascular disease have shown little variation and are around 80 per 100,000 population (11.4% of all deaths in 1990). More men are affected than women in each age group up to 75 years of age. Congenital heart disease (ICD-9, 745–746) is a leading cause of mortality and morbidity in the age group 0–4 years. Hypertension is the most frequent cause of first attendances at health centers in the age group 20 years and over.

Malignant Neoplasms

Since 1988 cancer has been the second leading cause of death, comprising 12.6% of all deaths, with a rate of 82.6 per 100,000 (1990). In women aged 15–44 years, cancer is the second leading cause of death (25.5 per 100,000). In this age group, the death rate for breast cancer is 16.6 per 100,000 females; from cancer of the prostate, 23.2 per 100,000 males; and from cancer of the stomach and colon, 7.3 per 100,000 males and females.

Accidents and Violence

Deaths due to injury are the prime cause of mortality in young persons aged 1–44 years, both males and females. The highest rates for 1990 are among males 15–44 years of age, in whom injury causes 47% of deaths (104.2 per 100,000), and females 15–44 years of age, in whom injury causes 20% of deaths. Among children 10–14 years old, 33% of deaths are due to injury. (These percentages include ill-defined causes.)

Motor vehicle accidents (ICD-9, E800–E848) cause the greatest number of all accidental deaths (10.59 per 100,000 in 1990), followed by accidental falls (E880–E888) and drownings (E910), in that order. Deaths due to falls occur most frequently in persons over 65 years of age. More than double the number of men die in motor vehicle accidents than women. In 1990 drownings accounted for 45 deaths in Trinidad and Tobago; the rate was only 1.97 per 100,000 in Tobago but 3.48 per 100,000 in Trinidad. Nineteen deaths resulted from accidents caused by fire (E890–E899). Deaths due to homicide (E960–E969) and purposely inflicted injury (E950–E959) numbered 70.

Behavioral Disorders and Disabilities

There is overt evidence of increasing mental illness in Trinidad and Tobago. A school survey (1988) indicated that the prevalence of alcohol use among students was 84%, the prevalence of tobacco use was 35%, and 44% used both. Acute heavy drinking and solitary drinking in adolescent females have been noted in another study as being twice as common as in adult females; 6.9% of young males interviewed demonstrated an addictive pattern of drinking. The same 1988 school survey found a prevalence of marijuana use of 8% and of cocaine use of 2%. In 1990, narcotics offenses represented 25% of the serious crime category.

A 1986 survey of psychiatric inpatient admissions from a defined geographic area with a population of 100,159 found that 81% of admissions were persons in the age group 20–49 years, which was twice the proportion of that age group in the population under study. Of the patients admitted, 38% had schizophrenic psychoses and 34% demonstrated alcohol and drug disorders. Almost half (49%) of first admissions were for alcohol and drug disorders, while 50% of those with schizophrenic psychoses had at least three previous admissions.

Studies of suicides and attempted suicides demonstrate a high incidence among adolescents and young adults under 34 years of age. Some 60% of deaths from suicide were in this age group.

Oral Health

Up-to-date data on oral health of the adult population are not available. In 1989 an oral health survey was conducted among 831 schoolchildren aged 6, 9, 12, and 15 years. For primary teeth the mean decayed and filled (DF) index values were 2.1 and 2.5 at ages 6 and 9 years, respectively. Mean values for the decayed, missing, and filled (DMF) index for permanent teeth at ages 12 and 15 years were 4, 1, 2 and 5, 1, 3, respectively. At 12 years of age, 21.6% of all children examined had decayed, missing, or filled teeth, and this percentage increased to 22.9 in the group 15 years of age. East Indian children generally had higher DF scores at ages 6 and 9 years and had a higher prevalence of gingivitis and calculus, whereas children of African heritage showed more bleeding and pockets.

Risk Factors

Risks in the Physical Environment

Water. Surface water sources account for 75% of all water supplies. Of 13 freshwater fish kills between 1980 and 1990, six were due to industrial waste and four to chemical poisoning.

Coastal pollution caused eight fish kills between 1976 and 1990. The recreational use of coastal waters has been adversely affected by sewage as a pollutant. Studies using rapid assessment methodology² indicate

that near-shore areas bordering the Gulf of Paria receive discharges of sewage, trace metals, and hydrocarbons. Oil spills occur from both ships and offshore rigs, and effluent is discharged without treatment into the sea from hotels and ships. Shellfish are now under special surveillance because of the cholera alert.

Air and Atmosphere. Smoke from sugarcane fires, emissions from both governmental and private establishments, petroleum fumes containing large amounts of lead given off by motor vehicles, and dust from quarries and cement factories are the most obvious sources of air pollution.

Forests. The forests harbor monkeys, which are reservoirs of the yellow fever virus, and also *Haemogogus* mosquitoes, which transmit the virus from monkeys to man. Similarly, other forest animals (armadillo and opossum) harbor *Trypanosoma cruzi*. Swamps and wetlands provide breeding places for the *Anopheles* mosquito.

Domestic and Industrial Wastes. Numerous unauthorized dumps and garbage collection sites contribute to the breeding of rats.

Risks in the Work Environment

The major risks in the work environment come from bad maintenance practices, improper lighting, and falling objects owing to failure to secure loads. In 1991 there were 703 industrial accidents reported. The leading causes were as follows: 196 were due to stepping on an object; 156 were caused by strains and excessive movement; 104 were from being caught between two objects; 78 resulted from exposure to extremes of temperature; and 64 were due to falls. Most accident reports emanated from the petroleum industry, assembly plants, and food processing plants.

Natural Disasters and Industrial Accidents

Trinidad lies just south of the usual hurricane path. Tobago, lying farther north, is more likely to be affected. The peripheral high winds and heavy rains of hurricanes may strike both islands. Heavy rains frequently cause flooding of low-lying land owing to rapid runoff from denuded hills, which contaminates agricultural land, crops, and water supplies and isolates villages by floods and landslides.

²Project Report from the Institute of Marine Affairs, "Use of Rapid Assessment Methodology for Determining Environmental Quality of Marine Shore Waters."

The islands are at risk from earthquakes.

Heavy industry, petroleum refineries, and chemical plants are located in the southwest of Trinidad, creating a high-risk area for industrial accidents.

There is a National Emergency Management Agency which responds to disasters and also carries out preparedness activities in order to reduce disaster impact.

Housing and Urbanization

Housing and urban development are regulated to diminish risks resulting from choice of inappropriate site, poor planning, defective building structures, and disregard for environmental and sanitation factors. These risks are very apparent in squatter settlements on hillsides and on some state lands such as disused railway tracks.

Contamination of Food

The risks of food contamination are great because of the widespread use of fertilizers, pesticides, hormones, and antibiotics. There has been a proliferation of roadside vendors selling prepared food under conditions of questionable sanitation. Many persons are exposed to this food, but the number of reported foodborne disease outbreaks is low.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

General Policies

Policies are being put in place to address the social issues resulting from rapid structural adjustment, especially among the most severely disadvantaged and vulnerable groups. Strengthening of the social services and development of a strategic plan for the implementation of social sector programs, employment training, and retraining are two of the priority initiatives being implemented. Strategic initiatives relevant to the social sector programs are enhanced fiscal discipline, reliance on the private sector for incremental investment, and export development as a major source of growth and employment.

Population Policies

Government has reappointed a population council with a mandate to formulate an explicit policy to influence population growth. Emphasis is being given to encouraging young women to postpone the age of first pregnancy by providing them with further education and employment opportunities.

Health Policies and Strategies

Organization and Administration of Institutions. National health policy states that health care is a basic right of all citizens and residents of Trinidad and Tobago. The Government is committed to restoring the quality of health care services in the country. A major 1992 policy document "The Decentralization of the Ministry of Health" has been produced. It outlines the process of reorganizing the Ministry to perform policy planning, analysis, and formulation and to assume a less executive role.

Human Resources. Emigration resulted in the loss of doctors, nurses, and other health-related professionals, while scarce financial resources curtailed training and continuing-education programs. To overcome the shortage of medical personnel, junior doctors and others with special skills have been recruited from overseas. The loss of nurses has reached the point where only 59% of established posts are filled. Enrolled nursing assistants are being trained in increased numbers to function in appropriate areas of patient care.

Spending and Financing. In accordance with national policies, the management of financial systems is to be strengthened and cost accounting systems developed to monitor expenditure within the health sector. Financing of health services comes from general revenue, but the Government is committed to the introduction of a national health insurance scheme. The latter will provide for the poor and unemployed but will require a contribution toward improved health care services from those who are able to pay.

Of the total recurrent expenditure estimated for 1993 (US\$ 118.35 million), 64% is personnel expenditure. The capital development program represents about 17% (US\$ 20.23 million). In order to implement administrative reform and decentralization, a health sector reform program is in progress.

Physical Resources. A planned program of rehabilitation of hospitals and health centers is ongoing.

Food and Nutrition. In 1989 a food and nutrition policy was formulated and a national food and nutrition coordinating and advisory body was appointed. As part of the cholera alert, increased attention has been given to food protection through public education programs and more effective monitoring of food safety practices.

Drinking Water and Sanitation. The provision of an adequate and safe potable water supply to all parts of the country is a commitment of the Government. The responsible statutory body, the Water and Sewerage Authority, which is also in charge of sewage disposal, has not always been able to fulfill this mandate and is the object of efforts to improve operational efficiency and financial viability. Self-help programs to extend water systems are encouraged.

The policy to encourage small business development with minimum capital brings with it the possibility of new dangers caused by businesses embarking upon production without investment in protection of the environment, the workers, or nearby residents.

Drugs and Immunobiological Products. The Government's policy is to follow an essential drugs program by limiting the choice of drugs available at institutions and, where possible, utilizing generic drugs. Quality control and safety of medicinal drugs are regulated by legislation covering importation and local manufacture of registered products. The enforcement agency is the Food and Drugs Division of the Ministry of Health. The sale of antibiotics, narcotics, vaccines, and other prescription drugs is restricted to licensed pharmacies managed by registered pharmacists. The local manufacture of pharmaceutical products is of limited range and on a small scale.

Diagnostic and Therapeutic Resources. Diagnostic laboratories and their operatives are not regulated, although this matter has been under consideration for some time. Private facilities have increased in number as a result of the Government's inability to meet the needs of the growing private health sector. The Eric Williams Medical Sciences Complex has extensive high-technology diagnostic resources. The Government's policy is to centralize these services at the Complex, which functions as a referral center for other public sector institutions.

Research and Development. Research and development in the health sector is uncoordinated. The Government has not allocated identifiable funds for health research.

Priority Programs. The major focus for the health sector is the program for its reform. This involves policy reform and rationalization studies, commissioning of the Eric Williams Medical Sciences Complex, and implementation of the national health insurance system. An essential component of this program is the decentralization process and reduction in the executive role of the Ministry of Health.

Priority is given to the following activities: reorganizing the primary health care system to achieve continued control of childhood and other communicable diseases; addressing the problems of chronic lifestyle-related diseases, including AIDS and STDs; and fostering and strengthening links with NGOs and community participation and empowerment. The Ministry has affirmed its policy to strengthen the capacity of the health education unit to effectively support the broad health programs.

Health Legislation. There is an urgent need to update and revise almost all of the legislation relating to the health sector, particularly the existing public health laws and those pertaining to the promotion and protection of health and the safety of the population.

Organization of Services

Personal Health Care Services

Infrastructure. Personal health care is provided by both public and private sectors; a limited range of services is also provided by NGOs, industrial corporations, and the national security services. Public sector care is available at institutions located throughout the country. Secondary care and tertiary care are focused at two general hospitals in Port of Spain and San Fernando (1,570 beds) as well as two county hospitals in Trinidad (162 beds) and one in Tobago (92 beds). There are also specialized hospitals and units for maternal care, psychiatry, chest diseases, substance abuse, geriatrics, oncology, and physical therapy, which total 1,829 additional beds, of which the psychiatric hospital is the largest (1,020 beds). A comprehensive range of diagnostic services is available at the two general hospitals. Primary health care is provided at 101 health

centers, 19 of which are in Tobago. The number of health centers in Trinidad per county varies from 5 in Nariva/Mayaro to 15 in Saint Patrick. The ratio of population to health center is less than 3,000 per center in Tobago; 5,000 to 10,000 per center in the counties of Saint Andrew/Saint David, Nariva/Mayaro, and Saint Patrick; 14,000 to 16,000 per center in Saint George East, Saint George Central, Caroni, and Victoria; and over 21,000 per center in Saint George West.

Traditionally, both inpatient and ambulatory care are delivered free of charge at the public institutions administered directly by the Ministry of Health. Minimum charges are made for certain diagnostic procedures, but at present there are no user charges.

Private general practitioners, specialists, diagnostic laboratories, and private hospitals are dispersed throughout the two islands, although they are clustered in the cities and larger towns. Of the 33 private hospitals registered with the Private Hospitals Board, 13 have operating theaters and offer some diagnostic services. While more than 50% of the population uses private sector ambulatory services, inpatient care in the private sector is too expensive for the average patient, unless he or she possesses private health insurance coverage.

Nongovernmental organizations provide diagnostic and screening facilities for the early detection and treatment of specific prevalent diseases and disabilities. Charges for services are modest, but since most NGOs are located in the cities, the cost of transportation may discourage utilization by disadvantaged persons from remote areas.

Large commercial enterprises provide health services for employees either directly, by specially contracted services, or through group insurance schemes. Dependents are included in the benefits, and one scheme includes retired employees. The national security services provide primary care for their officers and staff, and dependents are included in some of the programs. Secondary or tertiary care for security service officers is initially sought at the Ministry of Health hospitals.

Referral systems between the public and private sectors are facilitated by the fact that some health personnel are employed in both sectors. Strengthening of the referral systems in the public system is of primary importance in the proposed decentralization plan.

The Eric Williams Medical Sciences Complex is the first hospital to be administered by a board responsible to the Minister of Health. Primary (walk-in), secondary, and tertiary health care—both inpatient and

ambulatory—are being provided on a limited scale, as commissioning is still in progress. Diagnostic services are almost at full operational levels. A total of 8,514 radiology examinations and 3,682 laboratory investigations were carried out at the Complex during the 6-month period January to June 1992. The cardiology laboratory was commissioned in 1992 and is now in operation.

The hospital is vested in the board, which has to levy charges in order to balance its budget. Even though the Ministry of Health provides a large subvention, it also pays the fees of patients referred from government institutions.

Coverage. *Hospital discharges.* Figures for hospital discharges are incomplete; it is therefore difficult to identify trends. A gradual increase in annual discharges was observed, peaking in 1987 at both general hospitals: 62,719 at Port of Spain and 51,765 at San Fernando. Since then, discharges steadily decreased, down to 52,549 at Port of Spain and 43,119 at San Fernando by 1990, only to rebound to 58,291 and 46,538, respectively, in 1991. A similar trend has been seen in Tobago, where discharges averaged 5,500 annually for those years.

The average length of stay at general hospitals is 4 days, with occupancy rates of 66%–70%, except at San Fernando General Hospital, which maintained a bed occupancy rate of over 80% in 1990 and 1991. For all hospitals in 1991, the length of stay ranged from 1 day at Arima Maternity to 13 days at Couva district hospital and 48 days at the psychiatric hospital. The occupancy rates varied from 39.1% at Princes Town District to 88.7% at San Fernando General.

Outpatient consultations. The general hospitals conduct outpatient clinics in major specialties and subspecialties. County hospitals (three) provide outpatient clinics in major specialties. In addition, there are general medical consultations on a daily basis at those primary health care centers located in densely populated areas (six such centers) and on designated days in others. General, county, and district hospitals (eight) and two health centers provide a 24-hour accident and emergency service.

In 1988–1990, decreases were seen in the number of first visits and return visits to health centers, with 1991 showing a slight increase to 103,252 for health center service visits for the year and 280,543 for total number of visits for all sessions. In the age groups 20–44 years and 45–64 years in both Trinidad and Tobago, twice as many women as men attend health office sessions. The

reasons for this difference do not appear to be related to specific diseases, e.g., gynecological conditions.

Figures representative of outpatient consultations and diagnostic services in the private sector are not available.

Laboratory services. Pathology, biochemistry, and hematology services exist at the two general and three county hospitals.

Prenatal, delivery, and puerperal care. Over 50% of pregnant women attend free prenatal clinics in the health centers. At each visit they are examined by a midwife, and a medical officer examines them at least twice during the pregnancy. Referral of women with complications (about 19% of clients) to specialist clinics at six hospitals is facilitated. The established protocol for prenatal care at the health centers includes tests for anemia, VDRL, screening for diabetes, and tetanus immunization. In 1990, 4,044 doses of tetanus toxoid were administered to pregnant women. Only 20% of women make their first visit to the health center within the first 16 weeks of gestation. About 5% of those attending are under 15 years and 20% under 20 years; 7% are over 35 years. Iron and folic acid supplements are given to pregnant women.

About 80% of all deliveries take place in government institutions where there are facilities for cesarean sections, blood transfusions, and acute neonatal care. Seven percent of deliveries take place in government delivery units or district hospitals; 8.7% in private hospitals and nursing homes, most of which have facilities for cesarean sections; and 2% at "other places." Almost 90% of all deliveries are supervised by midwives, the other 10% by doctors or "other persons." Only about 10% of mothers utilize postnatal services at health centers.

Growth and development. First visits by infants in the first and second years of life amount to about 80% of the target population, but at 2 years of age coverage is less than 50%. The mean number of visits by infants under 1 year is 4.2, sufficient to produce adequate immunization; 20% of infants are visited at home.

At the clinic sessions weight-for-age measurements are taken. On average, each child attends a clinic 1.7 times between 1 and 4 years of age.

Immunizations. Free, routine immunization of infants and children is one of the programs offered in all health centers. Antigens are administered, according to the PAHO/WHO protocol, in the first year of life. Coverage for DPT and polio (three completed doses) was 82% in 1990. Yellow fever, measles, mumps, and rubella vaccines are given in the second year. In 1990, 69% of the target population was covered with the

three latter antigens, while 81.7% of 1-year-olds received yellow fever vaccines. Booster shots are given according to schedules at all schools. Pregnant women receive tetanus boosters if there is a need. BCG is not given routinely.

A national measles vaccination campaign in 1991 achieved 91% coverage of the target population (children 1–14 years old).

Family planning. Since 1987 management of family planning has been the responsibility of the population program within the portfolio of the ministry responsible for social services. In 1993, the program was returned to the portfolio of the Ministry of Health. The delivery of family planning services is shared by two main agencies: the Ministry of Health, as an integral part of the maternal and child health program in health centers as well as postnatal wards and clinics of hospitals; and the Family Planning Association of Trinidad and Tobago (FPA), an NGO. Both agencies carry out targeted public education programs and family life education programs in schools, with the collaboration of the Ministry of Education.

Since 1989 clinics of both the FPA and the Ministry of Health have attended a decreasing number of new acceptors. This trend has been most marked with regard to adults, among whom the figure for new attendances at FPA clinics in 1991 was 44%, which was less than that of 1989. In the case of the Ministry of Health clinics, the decrease in new attendances between 1990 and 1991 was 12.9%. Figures for teenagers are more constant. The range of fertility regulating methods available is limited. The most popular method remains condoms, followed by oral and injectable hormonal methods; the IUD is not widely used. Sterilizations requested at the FPA are mostly of females; a small number of vasectomies are also performed.

Food aid programs. The Government of Trinidad and Tobago does not receive food through international food aid programs.

Government subsidies, direct and indirect, for a wide variety of basic food items have been removed. The Government's school feeding program has been reorganized to include some children in secondary schools as well as an increased number of primary schools. Voluntary groups also provide food to schoolchildren and the needy. Public assistance grants, old age pensions, and other temporary grants for the destitute and needy provide a minimum cash payment for the purchase of food. These grants are administered by the Ministry of Consumer Affairs and Social Services.

Dental services. The dental services provided free of charge by the Ministry of Health are wide in geo-

graphic distribution but limited in content. Dental practitioners (21) provide a basic service to school-children and pregnant women, as well as palliative treatment to adults. The service is more focused on extraction than restorative treatment. The dentists are supported by dental nurses (55), who provide simple dental treatment, restorations, and prophylaxis to children under 12 years, as well as screening of school-children and dental health education in clinics and schools. Fifty-four health centers include dental clinics, six of them in Tobago.

At the two general hospitals, oral and maxillofacial surgery and dental services are available. Since 1991 the Dental Hospital at the Eric Williams Medical Sciences Complex has been open to provide complete dental care on a fee-for-service basis. Two levels of dentistry operate in the private sector: professional dentists and unlicensed dental operatives who practice illegally.

Psychiatric care. The psychiatric services provided by the Ministry of Health are still centered around the only major psychiatric hospital in the country. It houses an average of 1,400 patients. Community psychiatric services are divided into sectors on a geographic basis, with inpatient services similarly set up to provide continuity of care by the same therapeutic team.

The community services provide comprehensive, preventive, and therapeutic care for chronic and acutely ill patients, substance abusers, and disturbed children and adolescents; they also offer follow-up care for persons discharged from hospital. Decentralized inpatient services for the acutely ill are also provided at the general hospitals, county hospitals, and four extended care centers for elderly persons with chronic mental illness.

A specialized substance abuse unit is the main center for treatment of drug abuse, but there are also several small therapeutic and rehabilitative centers maintained by NGOs. Six or more NGOs organize support groups and offer counseling to prevent acute episodes of mental illness. A child guidance clinic, which serves the whole country, does its best to meet the needs of individual children as well as of those in the education system. Private sector care for the mentally ill is offered by both psychiatrists and psychologists.

Services for the disabled. The Ministry of Consumer Affairs and Social Services has responsibility for the needs of disabled persons. There are four major organizations providing therapeutic care and education for disabled children, all NGOs receiving government subsidies. Services are provided in north and south Trinidad and Tobago. Special teachers to assist dis-

abled children are posted in very few of the mainstream primary and secondary schools. The number of children on waiting lists for entry to special institutions may be equal to, double, or even triple the number of places. The goal of the services is to enable disabled children to enter the mainstream education system whenever and wherever possible and to equip them to live independent adult lives.

Blind persons receive a pension after age 40 years, and other associated grants are given to disabled adults without support. Sheltered workshops (where disabled individuals produce handicrafts and other goods) are very few and the employment environment is unfriendly.

Special programs. Special activities focus on preventing the reintroduction of the malaria parasite in the country.

Iodization and fluoridation of salt and the addition of iron, thiamine, riboflavin, and niacin to flour are performed to overcome identified deficiencies.

Surveillance of diarrheal disease has been stepped up since 1991.

Surveillance for bat-transmitted rabies continues and involves the veterinary public health unit of the Ministry of Health.

Paid screening programs for breast cancer and cancer of the cervix are provided by the Cancer Society, the Family Planning Association, and the Eric Williams Medical Sciences Complex. Free routine Pap smears are taken in some health centers and in gynecological clinics at government hospitals. The Cancer Society has a screening program for prostate cancer.

Environmental Services

Infrastructure. The role of private sector companies in the provision of environmental services is limited, and their fees are relatively high. Services are mainly provided by the Government.

Services. The Water and Sewerage Authority has the statutory responsibility to supply potable water to the nation and to collect and dispose of liquid waste. Services are performed for a fee. The Authority is heavily subsidized by the Government.

In urban areas, 87% of the total population has house connections and the remaining 13% has access to standpipes. All of the water supply in urban areas is chlorinated and meets WHO standards. In rural areas, 87% of the total population has access to safe water either piped or supplied by truck.

The entire urban population has adequate excreta disposal: 30% through house connections and 70% through privies. Almost all (97%) of the rural population has adequate excreta disposal.

Regular collection and disposal services for domestic garbage are provided free of charge to households by local authorities. In unauthorized or squatter settlements, which are inaccessible, this service is not available and garbage is picked up at a collection point. Other forms of refuse are collected by arrangement, for a fee. Private companies engage in removal of industrial and commercial waste, but use the local authority's disposal site. Local authorities clean drains and streets.

Arrangements for the disposal of toxic waste are made on an *ad hoc* basis or the waste is buried at the municipal dump. In both cases, there is the risk that seepage may contaminate soil and underground water supplies.

The insect vector control division is responsible for surveillance for insect vectors, the most important of which are *Aedes* and *Anopheles* mosquitoes.

Health Promotion

The Health Education Division implements programs in areas identified by the Ministry of Health as priorities. Nongovernmental organizations, regional institutions, and UN agencies participate in planning and implementing education programs.

Health promotion has become a popular subject with the media and with NGOs, service clubs, and church groups.

Research and Health Technology

Clinical, epidemiologic, and health service research is undertaken by units and individuals employed by the Ministry of Health, the University of the West Indies (UWI), NGOs, and the private sector. The Caribbean Medical Research Council encourages, develops, and coordinates research within the subregion and provides small grants to researchers. The Council organizes an annual meeting for the presentation of research papers by Caribbean scientists and clinicians. The Trinidad and Tobago Medical Association has also initiated an annual/biannual research meeting. Research papers are published in the *West Indian Medical Journal* and the *Caribbean Medical Journal*, as well as in international refereed journals.

Social and Community Participation

Through the NGOs, members of the community are participating in programs for the prevention and control of chronic diseases, prevention of blindness, screening for cancer, and other health activities.

Available Resources

Human Resources

Availability. In 1991 Trinidad and Tobago had 911 physicians, 2,523 nurses and midwives, 1,315 nursing assistants, 166 nursing aides, 109 dentists, 562 pharmacists, 49 optometrists, and 45 veterinarians. At the health centers there were 51 medical officers, 232 nurses, 182 nursing assistants, 21 dentists, and 40 pharmacists in 1990.

Training of Health Personnel. Training of health personnel is centered at the Eric Williams Medical Sciences Complex. Undergraduate and postgraduate education programs are offered for doctors, dentists, and veterinarians. The largest number of students are Trinidadians, but there are many from other countries in the Caribbean and elsewhere.

The responsibility for nurse training has been removed from the Ministry of Health and is now vested in the College of Nursing of the National Institute of Higher Education, Research, Science, and Technology (NIHERST). That institution also offers, at the College of Health Sciences, training programs for radiographers, laboratory technicians, and other allied health professionals, as well as continuing education. Training for pharmacists, public health inspectors, and visiting nurses is given as part of the UWI program of continuing studies.

Monetary Resources

Financing. Financing of public health services is by parliamentary allocation from general revenue. The revenue from user charges or other sources is inconsequential, except in the case of the Eric Williams Medical Sciences Complex. The Ministry of Health was allocated 6% of the total budget in 1993, ranking second to education in the social sector. The allocation for recurrent expenditure was US\$ 118,421,096 and that for expenditure on the development program was US\$ 20.23 million, 15% of the total. In real terms (1982

prices), public health expenditure has returned to near 1975 levels. In per capita terms, health expenditure increased from US\$ 44.58 in 1975 to US\$ 216.25 in 1981, and fell to US\$ 52.00 in 1989; there was a 6.5% decrease between 1983 and 1990.

The percentage decrease in major items of the health budget between 1987 and 1990 was as follows: salaries, 23.2%; minor equipment, 63.0%. Meanwhile, goods and services increased by 2.3%. A subvention of US\$ 4.71 million is allocated to the Eric Williams Medical Sciences Complex.

Spending. Reliable figures of income and expenditure of private sector establishments and health professionals are not available. After an initial fall in the estimated volume of private health care from 1987 to 1989, there has been a visible proliferation in private health care clinics and diagnostic facilities and expansion of private hospitals. Some of this expansion is due to the increasing number of workers covered by employment-linked group health insurance.

According to two reports from the Central Bank Library relating to changes in health sector expenditures, the expenditure by households on medical goods and services increased by 50% between 1981–1982 and 1988, from 2.2% to 3.3% of total household expenditure, while money spent on personal hygiene decreased from 1.8% to 1.4% of expenditure.

Physical Resources, Equipment, and Supplies

Since 1992 a program to renovate and refurbish institutions providing care has been in progress.

There is a centralized blood transfusion service with a centralized processing and distribution center. All blood is tested for human immunodeficiency virus (HIV) and Australia antigen (HBsAg). In addition,

most hospitals collect blood donations and maintain emergency stocks.

The Eric Williams Medical Sciences Complex has advanced diagnostic facilities. The general hospitals have X-ray and ultrasound facilities.

The National Radiotherapy Center at Saint James is the cancer treatment facility providing radiotherapy and chemotherapy. There are daily clinics and an overnight hostel for patients coming from Tobago or other distant points. Surgical and inpatient cancer treatment is provided at the general hospitals. The Cancer Society provides social and financial support and transportation for patients.

Extrasectoral Resources

Intersectoral collaboration is encouraged by the Ministry of Health. Close relationships exist and joint resources are maintained with the Ministry of Consumer Affairs and Social Welfare. This is particularly true in programs dealing with child welfare, teenage pregnancy, substance abuse, and the elderly, for which the resources of social workers, program planners, institutions, and NGOs are jointly mobilized.

Health promotion education is also supported by resources from the Ministry of Education, Ministry of Agriculture (nutrition, environment, and food protection), and nongovernmental organizations.

At the local level extrasectoral resources are more readily mobilized. These inputs are facilitated by local governmental bodies that are particularly concerned with environmental matters.

Disaster preparedness requires that considerable extrasectoral resources be held ready for emergency use. These efforts are coordinated by a central body, the National Emergency Management Agency.

TURKS AND CAICOS ISLANDS

GENERAL HEALTH SITUATION AND TRENDS

The Turks and Caicos Islands is a British Dependent Territory located 930 km southeast of Miami (United States of America), at the end of the Bahamas chain. The territory comprises eight main islands, six of which are inhabited, and many small cays. Grand Turk is the territory's administrative seat, and in 1990 it had a population of 3,691; Providenciales is the business center, and it has a population of 4,821. The May 1990 census put the total population at 11,465.

A Governor who serves as the Queen's representative, heads the territory's administrative structure and presides over an executive council, a legislative council, and a judiciary. The executive council includes a Chief Minister, four ministers, and three official members (the Chief Secretary, the Attorney General and the Financial Secretary). The Chief Minister is elected by the legislative council and then appointed by the Governor. The Legislative Council has eleven elected members and four appointed ones.

Health and Living Conditions

The economy is chiefly supported by tourism, fishing, and offshore banking. Over the last decade, tourism has increased significantly—in 1991, 55,200 visitors came to the territory, up from just under 12,000 in 1980. A small offshore banking and registration of offshore companies sector has been operating since 1980. Commercial fishing for conch and lobster also contributes to revenue.

Customs duties continue to be the highest single source of government revenue, accounting for 44% of the recurrent revenue for the financial year ending in June 1992. There are no income or property taxes. The total recurrent budget for 1988–1989 was US\$ 20,067,000. Government revenue and expenditure statistics estimated that the total recurrent expenditure for 1992–1993 was at an all time high (US\$ 29,181,000), with no deficit indicated. The annual GDP growth rate was 24.3% in

1988, 10.2% in 1989, and 7.3% in 1990; per capita GDP was US\$ 5,669 in 1990.

The tourism boom in Providenciales has resulted in significant economic development on the island, which now experiences a better quality of life than the other islands. Providenciales reportedly has full employment, and wages are generally higher there than on the other islands. Reliable labor statistics, however, are unavailable. Immigrants from Haiti and the Dominican Republic have provided much of the work force needed for the development of the tourist industry in Providenciales.

Certain areas have been identified as having higher than average poverty, such as Blue Hills, The Bight, and Five Cays in Providenciales and West Road, Over Back, and The Gardens on Grand Turk. Almost the entire island of South Caicos is economically depressed. There are about 400 people listed as welfare recipients throughout the territory. Immigrants also are a vulnerable group, especially those who are unemployed and those who have large families. Haitian communities, who live in extremely substandard housing, have significantly increased throughout the territory. Many other immigrants also live in substandard housing without piped water, sewerage, and/or garbage collection services.

The 1990 census indicated that there was an average of 3.3 persons per household, with the citizens' households having a slightly higher concentration (3.9 persons per household) than the non-citizens' (2.5 persons per household).

Less than half of all dwellings have an indoor kitchen with a permanent sink and fitted water supply. Gas is the most commonly used cooking fuel, but about one-quarter of households depend on oil or charcoal. More than 90% of households have a radio, and 75% have a television.

Population

The latest housing and population census for the territory was held on 31 May 1990. Of the 12,350 persons counted by the census, 11,465 were determined to be

TABLE 1
Resident population, by age and sex, Turks and Caicos Islands, 1990.

| Age group (years) | Total | | Males | | Females | |
|-------------------|--------|-------|-------|------|---------|------|
| | No. | % | No. | % | No. | % |
| All ages | 11,465 | 100.0 | 5,837 | 50.9 | 5,628 | 49.1 |
| 0-4 | 1,275 | 11.1 | 643 | 5.6 | 632 | 5.5 |
| 5-14 | 2,412 | 21.0 | 1,215 | 10.6 | 1,197 | 10.4 |
| 15-24 | 2,082 | 18.2 | 1,042 | 9.1 | 1,040 | 9.1 |
| 25-49 | 4,327 | 37.7 | 2,317 | 20.2 | 2,010 | 17.5 |
| 50-64 | 795 | 6.9 | 368 | 3.2 | 427 | 3.7 |
| 65 and older | 574 | 5.0 | 252 | 2.2 | 322 | 2.8 |

residents; the remainder were overseas visitors who were in the territory at the time. Of the residents, 7,901 (69%) were classified as "belongers," meaning that they were considered as citizens either by parentage, birth, or naturalization. In this report those who are not belongers are referred to as "expatriates."

Haitians constitute by far the largest single group of expatriates, representing at least 60%; immigrants from the Dominican Republic constitute the next largest group, representing just under 8% of the expatriate population tallied by the 1990 census. Because many of these persons enter the territory illegally and seek to avoid detection, it is difficult to estimate their real numbers. Given that citizenship is self-reported and that many expatriates are in the territory illegally, the census figures may underestimate the number of foreigners.

Table 1 shows the population distribution by age and sex—32% are under 15 years old, and 5% are 65 years old and older. In the general population, males outnumber females at a ratio of 1.04:1, while after age 49, the ratio switches to 83 males for every 100 females; the male concentration drops even farther after age 64.

The total dependency ratio, calculated at 59.1, indicates that for every 100 potentially economically active persons in the population (i.e., those between 15 and 64 years old), there are 59 dependent persons (i.e., those under 15 or over 64 years old).

In the intercensal period 1960-1970, the population's average annual rate of change was -0.2%; then, between 1970 and 1980, it grew at a rate of 2.9% per year. However, the fastest population growth occurred between 1980 and 1990, when the resident population jumped from 7,413 to 11,465, for an average annual growth rate of 4.46% in that decade. Much of this growth was due to immigration: according to official census counts, the number of expatriates residing in

TABLE 2
Population and percent change between 1980 and 1990, by island, Turks and Caicos Islands.

| Island | 1980 Population | 1990 Population | Percent change |
|----------------|-----------------|-----------------|----------------|
| Total | 7,413 | 11,465 | 55 |
| Salt Cay | 284 | 208 | -27 |
| Grand Turk | 3,098 | 3,691 | 19 |
| South Caicos | 1,380 | 1,198 | -13 |
| Middle Caicos | 396 | 272 | -31 |
| North Caicos | 1,278 | 1,275 | — |
| Providenciales | 977 | 4,821 | 393 |

the territory skyrocketed from 600 in 1980 to 3,564 in 1990.

As indicated in Table 2, in 1980-1990, the population clearly shifted from the outer islands to Grand Turk and Providenciales. Most of the population growth over the decade was concentrated in Providenciales, where the population grew from 977 in 1980 to 4,821 in 1990. The enormous population growth in the territory since 1980 has resulted in a great deal of construction outside traditional areas. This will necessitate a redefinition of the settlements on the islands affected, a process that is already under way.

Data on births and deaths pertain only to events registered in the territory. Although there is no estimate on the extent to which births and deaths of citizens occur outside the territory, given the small size of the population, the relatively small number of vital events occurring annually, and the scarcity of medical specialist services, it can be assumed that a significant proportion of residents travel abroad (primarily to the Bahamas or the United States) to deliver their babies or for medical treatment of conditions, some of which may result in death. Thus, the number of births and deaths taking place abroad could significantly affect the levels and patterns of vital statistics if they were included in the national data.

The documentation and coding of cause of death is not systematized. Many deaths in the islands are certified by a nurse and few are followed by a postmortem examination.

In 1992, a total of 263 births—the greatest number of births recorded in the territory in a single year—were registered, for a crude birth rate of 21.0 per 1,000 population. The figures for 1991 and 1990 were 211 (crude birth rate, 17.6) and 240 (crude birth rate, 20.9), respectively. In 1980, the number of registered births was 174 (crude birth rate, 23.5); and in 1970 the birth count was

185 (crude birth rate, 33.3). Only 44.6% of the births occurring in Grand Turk were to Turks and Caicos citizens; as many as 39.8% were to women recorded as being of Haitian nationality.

The 1990 census indicated that 230 resident *belonger* women aged 16 years old and older reported giving birth in the year prior to census day. Even within the limitations of the data, this figure compares favorably with the records from the Registrar of Births, which documented 192 births in 1989. The census also found that *belongers* aged 16 years old and older had an average of three births per woman. The fertility rate was highest in Middle Caicos, with 4.8 births per woman from the territory, and was lowest in Providenciales, where *belonger* women aged 16 years and older averaged 2.5 births.

The teenage pregnancy problem was indirectly assessed from the ledgers of the Civil Registration of Births in Grand Turk in 1992. Of the 263 births that occurred throughout the territory during this year, 211 (80%) took place in Grand Turk; of these, 31 (14.7%) were to women under the age of 20, and 2 were to women under 15 years old, both 13-year-olds from the Dominican Republic. Another 8 of these teenagers were in the age group 15–17 years old. Among *belongers*, births to teenagers represented 18.1% (with 6.4% being to women between 15 and 17 years old, and the others being to women 18 or 19 years old); among *expatriates*, 12.0% of births were to teenagers.

The other group of pregnancies at risk, as defined in the maternal and child health strategy for the Caribbean, is women 35 years old or older; the data indicate that 12.3% of the mothers in 1992 fell within this risk category. The differences between nationalities in this regard were significant, with Haitians having a greater proportion (19%) of births to women 35 years old or older than did *belonger* mothers (among whom 4.2% were 35 years old and older).

Mortality

In the 1990–1992 period, a total of 133 deaths occurred in the territory: 67 among males and 66 among females. However, without information on deaths of residents occurring abroad, it is difficult to interpret these data.

The leading group of causes of death in 1990–1992 was cardiac failure, accounting for about 37% of all deaths. External causes ranked second, representing 13% of total deaths; the single largest cause of injury resulting in death in this group was drowning (7 per-

sons drowned during this period). Other significant causes of death were conditions originating in the perinatal period, pneumonia, AIDS (with 28 deaths in 1985–1992), hypertension, cancer, cerebrovascular accidents, and diabetes.

For comparison, in the 1982–1984 period there were 115 deaths, of which 17 (15%) were from ill-defined causes. Of the 98 deaths from defined causes, diseases of the circulatory system accounted for 60% (58 deaths) and communicable diseases (not including AIDS) accounted for 20% (20 deaths); deaths from external causes only accounted for 2% (2 deaths).

Only one or two stillbirths were registered each year; although community health services' reports indicate that registration is incomplete in this regard. For example, although in 1990 the clinic in Grand Turk reported four stillbirths and the Providenciales clinic reported one, only one event was identified as a stillbirth in the official register for that year.

During 1990–1992, there were nine infant deaths (six in 1990, one in 1991, and two in 1992) and no deaths among children 1 to 4 years old. One child in the age group 5–14 years old died from what was defined as respiratory failure; 24 persons in the age group 15–44 years old and 24 in the age group 45–64 years old died; and there were 75 deaths (representing 53% of all deaths during this time) in the age group 65 years old and older.

Morbidity

The conditions most frequently seen in the territory's population continue to be chronic noncommunicable diseases, including cardiovascular disorders, hypertension, and diabetes mellitus, and certain infectious diseases such as influenza, gastroenteritis (particularly in children), and sexually transmitted diseases. Other diseases of public health importance include AIDS, tuberculosis, leprosy, foodborne diseases, and childhood infections, including chickenpox, measles, and mumps.

SPECIFIC HEALTH PROBLEMS

Communicable Diseases

Within the 1988–1992 period, 1989 stood out in terms of numbers of cases of notifiable diseases reported to public health officials. For example, cases of *malaria* were identified that year among six illegal immigrants, with no evidence of there having been any other cases

in the territory between 1985 and 1992 (the period of available data for this report). Eight new cases of *leprosy* also were reported in 1989; one additional case was found in 1990, and no other new cases were seen over the previous 8 years. There were 4 new cases of *tuberculosis* reported in 1989, after the all-time high of 12 new cases experienced in 1987. In 1988–1990 a total of 7 new cases of tuberculosis were reported, but no cases were reported for 1991 and 1992. Also in 1989, there were 15 reported cases of *hepatitis*; there were 3 in 1990, zero in 1991, and 6 in 1992. Finally, there was an increased number of *influenza* cases reported in 1989, when 645 cases were notified. Numbers had been as low as 232 in 1986, and the most recent report—for 1992—identified 452 cases.

There were outbreaks of *measles* in 1983, 1987, and again in 1990, when 100, 62, and 51 cases, respectively, were notified. Regional measles elimination efforts are expected to have an effect in the territory. The national immunization program indicates that the immunization coverage of infants with MMR vaccine has been steadily increasing; coverage levels were 68% in 1988, 76% in 1989, and 80% in 1990. By 1991 the situation had further improved, with MMR coverage in Grand Turk and Providenciales at 85%; it was 75% in South Caicos, 98% in Middle Caicos, and 100% in North Caicos. While there have been no cases of *mumps* reported in 1992, there were cases in each year from 1988 through 1991 (totaling 28 cases).

Gastroenteritis is a leading cause of illness among infants and young children. The number of cases reported between 1990 and 1992 totaled 531, and 1990 had the highest number of cases (243) reported in any single year within the 8-year period.

As of April 1993, 43 full-blown *AIDS* cases (and 28 deaths) had been reported; the male-to-female ratio is 1.7:1. A report prepared by the Chief Medical Officer states that "AIDS occurs primarily among young to middle age adults." To date, 663 persons are known to have tested positive for the human immunodeficiency virus (HIV) since testing was introduced in August 1985. Of this number, 79% are of Haitian nationality and 13% are citizens, but this distribution should not be equated with the relative prevalence of the virus in the two groups in the general community. Routine screening for HIV is performed on all applicants for resident and work permits, and those found to be positive, although they are refused permits, become part of the statistics on HIV. However, no screening has been conducted among nationals.

All participants in prenatal programs are screened as part of the care. Among the 663 persons identified as

HIV positive, 68 were pregnant women; of these 26% were nationals and 68% were Haitians; 3 were persons from the Dominican Republic; and 1 was of unknown nationality.

The Grand Turk data on births shows that about 45% of prenatal patients were nationals and about 40% were Haitian, suggesting that the prevalence of HIV among Haitian women living in the territory is higher than among nationals.

In 1988–1992, 101 cases of *gonorrhoea* and 76 cases of *syphilis* were notified.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Health Policies and Strategies

The main responsibility for the organization, implementation, and operations of health services in the territory rests with the Ministry of Health. This responsibility covers health-related areas of environmental services and all aspects of personal health services at the primary and secondary care levels. Primary level care is based in the clinics/health centers and their related community-based programs; secondary care is offered under hospital services, and tertiary care is provided overseas.

Overall, the Government aims at reducing its dependency on United Kingdom aid as the major source of public investment. The main thrusts of the policy toward this end involve implementing public sector and financial reforms, establishing a development corporation, and addressing the substantial physical infrastructure needs required to attract new investment.

The priority areas directly relevant to health and the environment that have been identified include pursuing mosquito control, improving water and sewerage facilities and services, upgrading the environmental program, and developing low-cost housing. The national strategic issues include overall cost recovery, the use of government health facilities by the immigrant population, the equitable distribution of health resources through the islands, the problems facing the government health service in attracting and retaining personnel, and the spread of HIV/AIDS.

Organization of Services

The territory's health services operate under the office of the Permanent Secretary for Health Services,

who answers to the Minister for Social Services. The health services are divided into three sections—medical, dental, and environmental health. The Chief Medical Officer is the director of the Health Department, and is responsible for the administration of all medical and health services and also serves as Hospital Medical Director, with clinical duties as well as administrative responsibilities.

Personal Health Care Services

Grand Turk Hospital is a 36-bed facility that provides general inpatient care and outpatient services. This institution includes laboratory facilities and an X-ray department, as well as postmortem, casualty, and geriatric services. During 1986–1992, the number of hospital admissions increased from 266 in 1986 to a peak of 970 admissions in 1992. The number of outpatient visits fluctuated, with an average number of 1,420 visits per year in 1988–1992 and a range of 1,830 (1990) to 1,115 (1992).

There are 10 community clinics distributed throughout the islands, which provide maternal and child health services, general medical services, and health education and counseling services. One clinic is in Grand Turk (population 3,700), one in South Caicos (population 1,200), three in Middle Caicos (population 300), one in Providenciales (population 4,800), three in North Caicos (population 1,300), and one in Salt Cay (population 200). The clinics in Providenciales, North Caicos (Bottle Creek), and South Caicos are equipped to accommodate deliveries. All island clinics have pickup vehicles; in addition, all the islands have airstrips, and doctors and nurses have the authority to charter planes to transfer patients to Grand Turk in emergencies. The annual number of visits to these services averaged about 27,500 in 1986–1989.

There are two private clinics in Providenciales—one is a two-bed facility with X-ray capabilities, a small laboratory, and a dental room, and the other serves as a general practitioner's private practice.

The Dental Health Services are operated by the Chief Dental Officer and three dental nurses from the main dental clinic in Grand Turk; there are seven dental clinics throughout the islands, which provide a full range of dental care. The dental department's main thrust for the school-age population is an active dental health education program, supplemented by clinical applications of fluoride, fluoride tablets, and fluoride vitamin drops. Varying fluoride concentrations exist in

the well waters of Middle Caicos, North Caicos, and Providenciales.

Environmental Services

The Environmental Health Department maintains or otherwise supports the wide variety of services that pertain to solid waste management, vector control, food hygiene, sewage disposal, water supply, and housing standards. The water supply needs for about 90% of the population are met exclusively by rainwater collection and by water wells, mainly dug wells. Such wells are common but yields are very limited except in small lenses in North Caicos and Middle Caicos. There is a general shortage of water. More than one-third of dwellings have no water tank, with North Caicos being particularly badly served, with 51% of its houses without a tank. There is legislation in force now that requires that persons build a tank, the capacity of which is determined according to the square footage of the roof.

The public water supply, which is chlorinated, is monitored for chemicals and bacteria by both the Water Department and the Environmental Health Department. The water is often found to have a disagreeable taste, odor, and color, as well as poor bacteriological quality. The large hotels have their own water supply, provided via desalination plants.

It is estimated that the wells in Providenciales are overtaxed by approximately 50,000 gal per day, where the source is estimated to produce about 150,000 per day. This strain on the supply necessitates increased environmental health monitoring.

The 1990 household census determined that 53.6% of houses have flushing toilets (42.5% with freshwater and 11.1% with saltwater). Disposal in these instances is by septic tank with soak-away or by package plant (a holding tank). A high proportion (43.6%) of households were found to rely on pit latrines, and 2.7% have no toilet facilities. North Caicos is worse off in this regard, because more than 13% of the houses on this island were reported to have no toilet facilities. Information on housing according to type of toilet facilities is limited to the homes of belongers, and, consequently, it is not representative of the population as a whole. As noted previously, most of the many immigrants live in substandard dwellings.

In general, the rocky ground makes installation of septic tanks expensive and difficult, which contributes to the pollution of shallow surface wells.

In terms of solid waste management, collections are by government trucks in Grand Turk and South Caicos, and by private contractors on the other islands. In all instances, disposal is by landfill.

Vector control is a high health priority, since large populations of mosquitoes and sandflies have been long-standing problems. The mean *Aedes aegypti* household index is estimated at 40%. This concern has received top priority at the national policy and planning level, and a mosquito control project is under way.

There are active programs for regulating food hygiene. Routine inspections are made at food handling establishments. All food handlers are required to have a valid health certificate, and education of food handling staff continues. There is only occasional inspection of foods upon importation, because qualified staff are not always available and because there are no regulations regarding inspections.

Available Resources

At the end of 1992, available human resources included 6 government physicians, 2 private physicians, 49 nurses and midwives, 3 pharmacists, 2 dentists (1 in private practice, and 1 in government service) and 1 trained environmental health officer. Much of the pro-

fessional staff is made up of expatriates, primarily persons from other Caribbean islands and from Guyana.

Aside from any on-the-job training opportunities, the only health-related training program available within the Turks and Caicos Islands is for community health aides. The training of nurses is carried out primarily in Jamaica or Barbados; environmental health basic training and the dental nurses program are normally carried out in Jamaica.

The large population growth occurring in Providenciales and its attendant development activities have enormous economic and social implications for health resource planning. The two overriding targets have been identified as the improvement and expansion of facilities and services and the mandatory provision of a cadre of health workers to support these services.

In the longer term, a hospital services facility is scheduled for Providenciales. Even as a primary health care facility, the existing clinic in Blue Hills is inadequate. A new health center is being built in a central location in order to serve the needs of the three major settlements.

However, the health services continue to suffer from problems of retaining qualified staff and of attracting qualified belongers back to the Turks and Caicos Islands. At least half of the nurses that go for training to the Bahamas, Jamaica, Barbados, or the United States of America are not expected to return.

UNITED STATES OF AMERICA

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

During the last 10 years, citizens of the United States¹ have improved their health situations and are living longer. Between 1980 and 1990 overall life expectancy at birth increased from 73.7 to 75.4 years, a gain of 1.7 years. However, increases in life expectancy over the decade ranged from only 0.7 years for African American males to 2 years for white males, thereby widening the gap in life expectancy between these populations.

By 1990, a person who had reached the age of 50 years could expect to live an average of 29.0 more years, for a total of 79.0 years. A person reaching the age of 65 could expect to live an average of 17.2 more years, to 82.2 years. Life expectancy at birth was much higher for whites (76.1) than for African Americans (69.1); for white males, life expectancy was 8.2 years longer than for African American males, while for females the difference was 5.8 years.

In 1990 approximately 33.7 million people were living in poverty. The national poverty rate was 13.5% in 1990, up from 12.8% in 1989. The poverty rate among the largest minority group, African Americans, is 31.9%—triple the rate among the white population.

Between 1989 and 1991 the poverty rate for female-headed households with children increased from 43% to 47% and the poverty rate among children increased from 19% to 21%. In 1991 the percentage of African American children living in poverty (46%) was almost three times that of white children (16%). Poverty among Hispanic children was 40%, 2.5 times the rate among white children.

Population

In 1990 the resident population of the United States totaled 248.71 million, 10% greater than in 1980. Between 1980 and 1990 the elderly population and certain minority groups in the United States grew faster than the general population. The population aged 75–84 years grew by 30% to 10 million, and the population aged 85 years and over grew by 35% to 3 million. The African American population increased by 15% to 30 million, and the Hispanic population increased by over 50% to 22 million. The Asian and Pacific Islander population more than doubled, reaching 7 million.

Mortality

In 1990, 2,148,463 deaths were registered in the United States. The death rate for 1990 was 863.8 deaths per 100,000 population, 1% below the rate of 871.3 per 100,000 in 1989 and 3% below the rate in 1988. Provisional data for 1991 suggest that the death rate continued to decline.

The age-adjusted death rate, which eliminates the effects of the aging of the population, was at a record low of 520.2 per 100,000 population, 1.5% below the 1989 rate of 528 and 4% below the 1988 rate of 539.9. The age-adjusted rate decreased for both the white and African American populations between 1989 and 1990. For most of the 10-year age groups for males and all of the age groups for females, death rates declined between 1989 and 1990 for all races combined. However, death rates increased for males aged 15–24 years and 35–44 years, and slightly for those aged 85 years and over. The cause of death contributing most to the increase in death rates for the white population and the African American population aged 15–24 years was homicide, and for the white population aged 35–44 years it was HIV infection.

The age-adjusted death rate for all causes combined was about 74% higher for males than for females. For each of the 15 leading causes of death, male mortality was also higher. The greatest sex differential was for HIV infection, where the age-adjusted rate for males

¹Except where otherwise specified, this chapter covers the 50 states that constitute the United States of America, and the District of Columbia.

was 8.4 times that for females. The smallest sex differential was for diabetes mellitus, with a male-to-female ratio of roughly 1:1.

During the 1980s there were major declines in the death rates for three of the leading causes of death among the U.S. population: heart disease, stroke, and unintentional injuries. Much of the decrease in disease can be attributed to the reduction in risk factors that cause life-threatening illness. Accompanying these trends are increased public awareness of the risks posed by such activities as tobacco use and driving while under the influence of alcohol.

Between 1980 and 1990 the age-adjusted death rate for heart disease, the leading cause of death for men and women, declined 24%. This dramatic reduction reflects increased high blood pressure screening and control, a decline in cigarette smoking, and an increased awareness of the role of dietary fat in production of cholesterol. The decline in heart disease mortality since 1980 was 27% for white men, 23% for white women, and 17% for African American men and women. In 1990 heart disease mortality was almost twice as great for white men as for white women and more than 60% greater among African American men than African American women. In 1988–1990 the age-adjusted death rate for heart disease among persons of Asian descent aged 45 years and over (290.1 deaths per 100,000 population) was about 25% lower than the rate for Hispanics and American Indians, close to half the rate for white persons, and 63% lower than the rate for African Americans.

Between 1980 and 1990, death rates from stroke, the third leading cause of death, declined by 32%, continuing the downward trend of the 1970s. Declines in stroke mortality since 1980 ranged from 28% for African American men to 34% for white men. In 1990 age-adjusted death rates due to stroke were twice as high for African American men as for white men, and almost 80% higher for African American women than for white women.

Deaths among African American and white women due to lung cancer showed a 41%–46% increase between 1980 and 1990. Likewise, death rates from this disease increased for African American men (by 11%), while they remained stable for white men. In 1990, age-adjusted lung cancer death rates for African American men and white men (91.0 and 59.0 deaths, respectively, per 100,000) were two to three times those for African American women and white women (27.5 and 26.5).

Between 1988 and 1990, the age-adjusted death rates for all cancers for American Indians, Asians, and His-

panics aged 45 years and over were similar (265.0, 271.9, and 278.3 deaths per 100,000); these rates were considerably lower than the rates for white or African American persons (456.4 and 621.1 deaths per 100,000).

With the decline in deaths from heart disease, cancer has been the leading cause of death for people 25–64 years of age since 1987. In 1989 cancer resulted in 290.9 deaths per 100,000 persons aged 45–64. It is estimated that 30% of cancer deaths are linked to smoking and another 35% are linked to diet. Breast cancer rates remain high despite the attention paid to early detection and treatment. Cancer accounts for about one of every five deaths in the United States each year, and in 1990 it claimed the lives of 505,322 people. Overall cancer mortality rates have changed little since 1950.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Infant Health

The infant mortality rate in 1990 was 9.2 deaths per 1,000 live births. Between 1980 and 1990, the infant mortality rate for white infants declined by 30%, from 11.0 to 7.7; for African American infants, it declined by 21%, from 21.4 to 17.0.

Each year in the United States almost 39,000 babies—nearly 1% of those born—die before they reach 1 year of age. The five leading causes of death in 1990 were congenital anomalies, sudden infant death syndrome, disorders relating to short gestation and unspecified low birthweight, respiratory distress syndrome, and maternal complications of pregnancy.

The overall percentage of live-born infants weighing less than 2,500 g remained generally stable at around 7% between 1980 and 1990. However, the proportion of infants weighing less than 1,500 g at birth (those at greatest risk of death and disability) increased 18% for African American infants and 5% for white infants during this period. In 1990 the percentage of African American infants weighing less than 1,500 g was three times that of white infants (2.83% compared with 0.95%).

Maternal cigarette smoking has been linked with 20% to 30% of all low birthweight births in the United States. Other major problems associated with low birthweight include lack of prenatal care, young age of the mother, and alcohol and drug use.

The spread of HIV/AIDS among women and heterosexual men has resulted in increasing numbers of

seropositive newborns. Infants born with HIV infection require more intensive health care services throughout their lives. Through June 1993, AIDS had been reported in more than 4,700 children (under 13 years old); 87% of the children were infected perinatally. From 1991 through 1992, the number of AIDS cases reported among children under 5 years of age increased by 16.6%. Between 1,500 and 2,000 new infections annually are due to transmission of the virus to newborns from HIV-infected mothers.

Child and Adolescent Health

The coverage rates for DPT, polio, and measles immunizations given between 12 months and 2 years of age are 67%, 53%, and 80% respectively. This level of immunization coverage is much lower than in many other countries, including many developing nations.

Although the majority of children are effectively immunized, outbreaks of communicable diseases still occur throughout the United States, indicating that vaccination programs have not adequately reached many children, especially in rural and inner city areas. Nevertheless, other than an increase in the number of measles cases between 1989 and 1990, especially among preschool-aged children, there were no important outbreaks or epidemics of vaccine-preventable diseases.

Nearly half of all childhood deaths are due to unintentional injuries, and about half of these occur as a result of motor vehicle accidents. The number of childhood deaths due to automobile accidents has declined as a result of laws in all 50 states that require car safety restraints for young children.

The three leading causes of death among teenagers are unintentional injuries, homicide, and suicide. While motor vehicle deaths involving alcohol are the greatest risk to white males in the age group of 15–24, homicide is the leading killer among African American males in the same age group. The death rate from motor vehicle accidents for young white men was 54 per 100,000 in 1989.

Between 1985 and 1990 the age-adjusted homicide rate increased 23% to 10.2 deaths per 100,000 population, after having declined by a similar amount in the first half of the decade. The largest increases since 1985 were for African American males and white males 15–24 years of age, whose homicide rates rose 110% and 40%, respectively. In 1990 the homicide rate for young African American males was nine times the rate for white males.

The suicide rate for American Indian youth 15–24 years of age (26.8 deaths per 100,000 population) was nearly twice the rate for white youth, about three times the rate for African American and Hispanic youth, and 3.6 times the rate for Asian youth.

High school students are at risk for acquiring HIV infection, since studies have indicated that the average age at first intercourse is 16 years. Through June 1993, there have been 1,301 reported cases of AIDS among adolescents (13–19 years of age); 11,840 among 20–24-year-olds; and 47,777 among 25–29-year-olds. Because the time from infection with HIV to development of AIDS can be 10 years or more, many people with AIDS who are in their twenties were infected as teenagers. The proportion of adolescent AIDS cases diagnosed among females has almost tripled in recent years, from 14% in 1987 to 38% in 1992.

Other threats to child health include mental retardation, learning disabilities, and emotional and behavioral problems. These conditions seem to be more prevalent among children living in poverty than among children in higher socioeconomic situations.

Health of Women

The fertility rate in 1990 was 70.9 live births per 1,000 women 15–44 years of age, 4% higher than the rate of 68.4 in 1980. There were 4.21 million babies born in the United States in 1990, a 3% increase over 1989 and the largest number of births reported in any year since 1962. However, provisional data for 1991 and 1992 indicate a 1% decline in the number of births.

Between 1986 and 1990 the fertility rate rose at an average annual rate of 2%. The increase was greatest for women aged 35–44 years (7%–8%) and for teens aged 15–17 years (5%). The increase in the birth rate for women 35 years and over reflects a continuation of a trend among U.S. women of postponing childbearing until relatively older ages. The rise in birth rates among teenagers is associated with the growing proportion of teenagers who are sexually active.

Another factor related to the increase in birth rates among teenagers is the growing proportion of all teen births represented by births to Hispanic young women—19% in 1990. Hispanic women, who are predominately white (97%), have much higher fertility than non-Hispanic white women at all ages. The birth rate for Hispanic teenagers 15–19 years was 100.3 per 1,000 in 1990, compared to 42.5 for non-Hispanic white teenagers and 54.8 for all non-Hispanic teenagers. Moreover, the Hispanic teen population has increased

substantially in recent years, while the non-Hispanic teen population has declined. Among Hispanic groups, fertility of Mexican American women was highest (118.9), followed by "other Hispanic" women (102.7), Puerto Rican women (82.9), and Cuban American women (52.6). There has not been a significant change in the relationship of these rates since 1989.

Sexually transmitted diseases (STDs) pose a substantial risk to women in the United States. In 1991 rates for syphilis and gonorrhea among women were 15.1 and 208.3 per 100,000, respectively. Once infected, women are less likely than men to have symptoms, less likely to seek care, and less likely to be diagnosed correctly after seeking care. Since STDs in women pose far more serious complications than in men (including infertility, ectopic pregnancy, and cervical cancer), it is important for women to be knowledgeable about the prevention, diagnosis, and implications of STDs.

Among women aged 18–44 years, AIDS is the sixth leading cause of death. The number of AIDS cases due to heterosexual transmission of the virus to women rose 22% between 1990 and 1991. Although African American and Hispanic women comprise only 21% of the female population, 72% of the women diagnosed with AIDS since 1981 belong to these ethnic groups.

Several Federal programs provide family planning services to low-income women. Medicaid currently provides over \$200 million annually to support family planning services. In an effort to control the number of teen pregnancies, the Adolescent Family Life Program has a fiscal year (FY) 1993 budget of \$7.8 million. It focuses on issues of adolescent sexuality, pregnancy, and parenting through care and prevention demonstrations and research projects. Parental consent is required for receipt of services.

In 1988, 60.3% of women between 15–44 years of age were using some form of contraceptive. New contraceptive choices such as the Norplant implant and the "female condom" are currently available; however, the implant is costly and the extent to which it will be available to low-income women is uncertain. Wide availability and acceptance of this form of contraception would greatly reduce the number of unwanted pregnancies. The female condom has the potential to greatly reduce the incidence of STDs among women who use it. However, its acceptability and use in populations at greatest risk for these infections and unwanted pregnancies is still unknown. Abortion is legal in the United States, except in the State of Utah. Provisional data for 1990 show that the abortion ratio was 344 abortions per 1,000 live births, down slightly from 359 in 1980. The abortion rate is 24 per 1,000 women in

the age group 15–44. This rate has remained stable since 1982.

In 1990, an estimated 150,000 new cases of breast cancer were diagnosed in women, making it the second leading cause of cancer deaths among women. It is estimated that 1 in 10 women will develop breast cancer in their lifetime. Although African American women have an 18% lower incidence of breast cancer than white women, their survival rates are significantly lower, a difference most probably caused by earlier diagnosis of the disease in white women.

The incidence rate of lung cancer in men began to decline in 1984, but the rate among women continues to rise.

Although incidence rates for colo-rectal cancer have increased since 1973, they seem to have peaked among white males and females. Between 1985 and 1989 there were significant declines in incidence in both sexes in the white population, a modest decline in African American females, and a slight increase in African American males. Mortality rates for colon cancer have decreased significantly among whites and increased significantly among African Americans; however, for African American females the mortality rate for colo-rectal cancer has fallen since 1985.

Health of the Elderly

One of the greatest challenges facing the health care system is the aging of the population. It is projected that the number of people 65 years and over will rise to 35 million by the year 2000, which will equal 13% of the population. That proportion is expected to climb as high as 23% by the year 2040.

Most significant, however, is the rapid growth of the population 85 years of age and over, whose numbers are expected to rise 52%, to 4.6 million by the year 2000. As a result, a considerable increase will be seen in such disabling conditions as hip fractures and Alzheimer's disease.

The major causes of death among persons aged 65 and older are heart disease, cancer, stroke, chronic obstructive pulmonary disease, pneumonia, and influenza. Because pneumococcal disease is three times more prevalent among those over 65 than among younger people, immunization for older adults is considered a preventive service.

Chronic problems such as arthritis, osteoporosis, incontinence, visual and hearing impairments, and dementia are also important health problems because of the significant impact these conditions have on the

day-to-day lives of seniors. Health promotion is believed to offer major benefits toward maintaining the health of the elderly. Physical activity and proper diet can increase bone mineral content, reduce the risk for osteoporotic fractures, and help maintain appropriate body weight.

Health of Special Populations

Racial/ethnic minority populations have increased much faster than the white population over the past two decades. This trend is expected to continue for at least the next 30 years. From 1990 to the year 2020, it is projected that the African American population will increase 35%, while during the same period the populations of other minority races (mostly Asian/Pacific Islanders, but also American Indian/Alaska Natives) will more than double. The Hispanic population is expected to rise by 84%. The projected increase in the white population during this time is only 11%.

While chronic disease conditions are the leading causes of death for both minority and nonminority persons over 45 years of age, minority populations (African Americans, Hispanics, Native Americans, and Asian American/Pacific Islanders) incur a disproportionate share of death, illness, disability, and adverse health conditions. Commonly used health indicators such as life expectancy at birth and infant mortality rates show the continued widening of the health gap between minority and majority populations. Poverty is a major contributing factor to the disparities in health status.

African Americans. As the largest minority group, African Americans make up 12% of the nation's population. Although African Americans live in all sections of the country and occupy every socioeconomic level, one-half of the total population lives in urban areas that are typified by poverty, poor schools, and inadequate housing, and one-third of the population lives in poverty—a rate three times that of whites.

Overall, death rates among African Americans exceed those of the white population by 60%. Rates are also higher for most of the leading causes of death. The cause for which the rate differential between the races was largest continued to be homicide, with an age-adjusted death rate in the African American population in 1990 that was about seven times higher than in the white population. In 1988 homicide was the leading cause of death among African Americans 15–44 years of age. Age-adjusted mortality rates for chronic dis-

eases are one-third to nearly three times higher in the African American population than in the white population. The death rates for colo-rectal, respiratory, and breast cancer among the African American population have worsened compared with the rates among the white population. The two leading causes of death for which rates were lower among African Americans than whites were chronic obstructive pulmonary diseases and allied conditions, and suicide.

Hispanics. Hispanic subgroups, including Mexican Americans, Puerto Ricans, Cuban Americans, and Central and South American immigrants, make up the second largest minority group, comprising about 9% of the total population in 1990. The Hispanic population is currently the fastest growing minority group. It is youthful, with a median age of 26 compared to 33 for the total population. The birth rate among Hispanics was 26.7 births per 1,000 population in 1990, while that of the total population was 16.7 births per 1,000.

Smoking appears to be a substantial risk to the health of Hispanics, since 43% of Hispanic men currently smoke and teenagers of both genders smoke more than African American or white teenagers. Hispanic teenagers also report more frequent use of alcohol than African Americans and whites.

Among the Hispanic population diabetes mellitus and chronic liver disease/cirrhosis occur at substantially higher rates than among whites. In 1987, the age-adjusted death rates for Hispanic men with diabetes were 80% higher than for white men; among women, the differences were even greater, with Hispanic women 2.0 to 2.5 times more likely to die from diabetes than white women.

Asians and Pacific Islanders. The nation's third largest minority is characterized by diversity. Asian and Pacific Islanders in the U.S. speak over 30 different languages and represent many cultural groups.

Asians born in this country into families established here for generations are virtually indistinguishable socioeconomically from the majority population. Their median income is higher than that of the overall population.

Although data are sporadic, local studies have identified certain diseases that pose special health risks for Asian Americans and Pacific Islanders. The breast cancer rate among Native Hawaiians is 111 per 100,000 compared to 86 per 100,000 among whites. The lung cancer rate is 18% greater for Southeast Asian men than for white men. Higher rates of high blood pressure have been documented among Filipino men aged

50 and over living in California than among the total California population.

Two infectious diseases, tuberculosis and hepatitis B, are of particular concern to Asian and Pacific Islanders, posing a special risk in immigrant communities. Among Southeast Asian immigrants the rates for these conditions are 40 times higher than in the total population. Another risk factor of great concern is the prevalence of smoking among Laotian (92%), Cambodian (71%), and Vietnamese (65%) men resident in California, compared to a 30% rate for the overall American population of the United States.

Native Americans. The original inhabitants of North America, the Native American Indian and Alaska Natives, form the smallest minority group, now numbering 2.1 million. About 50% live in urban areas, while many of the rest live on reservations. Health care for this native population is provided by the Federal Government through the Indian Health Service.

The American Indian and Alaska Native population is relatively youthful because a large proportion of persons die before 45 years of age. Among Native Americans, age-adjusted death rates for diabetes, liver disease, and tuberculosis are two to three times higher than the comparable rates for the total U.S. population.

The injury death rate for American Indians 15–24 years of age is two to three times higher than the rate for any other group. The major cause of death among Native Americans under the age of 45 is unintentional injuries, which most often follow alcohol use (75%). More than half (54%) of the motor vehicle accidents in this population have been attributed to the effects of alcohol.

Alcoholism is the number one health and social problem of the American Indian and Alaska Native people. The 1988 age-adjusted death rate for alcohol-induced causes among American Indians and Alaska Natives was 33.9 deaths per 100,000 population—five times the rate for the general population (6.3 deaths per 100,000). Smoking and other tobacco use are also significant health problems.

Refugees. Approximately 131,600 refugees were admitted to the United States in 1992. About 46% came from Eastern Europe and the former Soviet Union, 39% from East Asia, 6% from the Near East and South Asia, 3% from Latin America and the Caribbean, and 4% from Africa. Upon arrival in this country, their reception and initial placement is the responsibility of 12 nonprofit organizations which operate through feder-

ally funded cooperative agreements with the Department of State.

The number of refugees entering the United States in FY 1992 represents an increase of 16% over the 113,600 refugees who entered the country in 1991. During 1992, a total of 3,919 persons were granted political asylum after arrival in the United States, an increase of 60% as compared with the 2,344 successful asylum applicants in 1991.

Because refugees often have health problems that stem from the conditions in their countries of origin, health care services are offered in first-asylum camps located in refugee processing centers. At ports of entry, refugees and their medical records are inspected by quarantine officers, who also notify the appropriate state and local health departments of the arrival of these refugees.

The Government provides close to US\$ 5.8 million to support refugee activities both overseas and domestically. Grant program funds are awarded to state and local health offices for post-arrival health assessments to help identify health problems that might impair effective resettlement, employability, and self-sufficiency of newly arriving refugees.

Other Special Groups. The homeless are the focus of a government-sponsored program known as Health Care for the Homeless (HCH), which is intended to improve access by homeless individuals to primary health care services and substance abuse treatment. In 1992, 110 HCH programs were supported in 46 states, the District of Columbia, and Puerto Rico.

Residents of public housing projects have also been targeted for assistance with Federal funds to help overcome barriers to health services such as lack of transportation, language difficulties, and lack of financial resources. In 1992, a total of US\$ 6 million was awarded to 14 grantees to improve access to health care for persons who reside in public housing.

Diseases and Health Impairments

Measles

Unlike diphtheria, tetanus, pertussis, and polio, which either decreased or remained at a constant low level in 1988–1992, measles took a more volatile course, with a major outbreak occurring in 1989–1990 after almost 10 years of relatively few reported cases. The number of measles cases in 1989 was higher than the median number reported annually during the pre-

ceding 8 years. The epidemic continued into 1990, with 27,786 cases reported.

The outbreak affected all age groups, but the most notable increases in incidence occurred in preschool-aged children and adults over 20 years old. Data gathered from several cities indicated that measles vaccination coverage was only 40–65% in kindergarten children, and low coverage significantly contributed to the spread of the disease. However, measles outbreaks also occurred among school-aged children with high vaccination coverage rates, prompting 21 states to now require students to receive a second measles vaccination upon entering kindergarten, first grade, or middle school.

Tuberculosis

After decades of decline, the incidence of tuberculosis (TB) has been on the rise in the United States since 1985. A total of 26,673 new cases of TB were reported in 1992, a 20% increase over 1985. The increment is due to many factors, including the HIV epidemic, a deterioration in the local public health care infrastructure, and increases in the number of cases among foreign-born persons.

Recent outbreaks have prompted great concern owing to the occurrence of resistant and multi-drug resistant TB (MDR-TB). A national task force has been created to expand the 1989 Strategic Plan for the Elimination of Tuberculosis in the United States. A national action plan to control MDR-TB has been developed to define the steps that must be taken to bring current TB outbreaks under control, prevent new ones, and work toward the ultimate elimination of TB.

HIV/AIDS

An estimated 1 million persons in the United States are currently infected with HIV. As of June 1993, 315,390 AIDS cases in adults, adolescents, and children had been reported, and a cumulative total of 415,000 to 535,000 cases is projected by the end of 1994.

HIV infection continues to be a major health problem, with racial/ethnic minorities bearing a disproportionate share of the burden. Cases among African Americans and Hispanics increased 8.8% and 1.0%, respectively, between 1991 and 1992, reaching rates of 52.2 per 100,000 population in African Americans and 29.9 per 100,000 in Hispanics, compared to 11.7 per 100,000 in whites.

In the 1991–1992 period, a larger proportionate increase in reported cases occurred among women (9.8%) than among men (2.5%). For women, rates were higher among non-Hispanic blacks and Hispanics (31.3 and 14.6 per 100,000 population, respectively) than among non-Hispanic whites (1.8). African American children account for 55% of all reported pediatric AIDS cases.

In the United States the primary exposure categories for reported AIDS cases are still men who have sex with men (55%) and injecting drug users (24%). However, a small but growing number of persons have been infected through heterosexual contact (7%). Notably, in 1992 for the first time the number of AIDS cases diagnosed among women infected through heterosexual contact exceeded the number infected through injection drug use.

Prevention programs, directed toward changing behaviors, continue to be the main strategy in the struggle against HIV/AIDS. Massive education and prevention programs have been undertaken to reduce injection drug use, decrease high-risk sexual behaviors, and increase the use of condoms. Efforts to develop creative preventive programs, improve care of AIDS patients, and conduct research on care have been initiated throughout the country. An example is the HIV Early Intervention Program, aimed at attracting and retaining hard-to-reach populations in treatment programs. By 1992, it was serving an estimated 96,000 individuals who were infected with HIV, 40% of whom were women and 55% minorities.

There has been a dramatic shift in the financing mechanism for treatment of AIDS-related diseases. Because many of those infected with the disease do not have medical insurance and others have depleted their private insurance and personal resources to pay for costly treatment, much of the cost for treating HIV/AIDS is eventually borne by local and state public sector programs as well as Medicaid.

Behavioral Disorders

Approximately 3.9 million persons received care from some specialized mental health institution during 1986. Most of these patients were admitted to out-patient programs.

Persons between the ages of 25 and 44 made up the largest group (48%) of patients in inpatient mental health programs; the median age of persons in these programs was 34 years. The 25–44 year age group accounted for the largest percentage of persons under

care in every type of institution except private psychiatric hospitals, where there were more patients under 18. The most frequent diagnosis for patients entering inpatient settings was affective disorders (31%), followed by schizophrenia (23%) and alcohol-related disorders (15%).

Of the estimated 1.4 million patients in outpatient programs, over half were being cared for in multiservice mental health organizations. Freestanding and non-Federal general hospitals followed in frequency. Smaller percentages of these patients were seen in veteran's medical centers, state and county hospitals, and private psychiatric hospitals.

Of the patients served in outpatient settings, males and females were equally represented. Among minority clients, more males than females were under care in private psychiatric hospitals and multi-service mental health organizations. Among whites the reverse trend was seen in private hospitals, where more females than males were treated.

The total number of organizations providing mental health services rose from 3,005 in 1970 to 4,747 in 1986, while the number of beds fell drastically from 524,878 in 1970 to 247,312 in 1982 and recovered slightly to 267,613 by 1986.

Substance Abuse

Estimates from the 1991 National Household Survey on Drug Abuse indicate that the several-year downward trend in illicit drug use may be leveling off. Although prevalence rates for current use of drugs among youths aged 12–17 years declined by more than one-half between 1985 and 1991, drug use in this age group remained virtually unchanged from 1990 to 1991. Cocaine prevalence peaked in 1985 and declined dramatically between then and 1991. Marijuana remains the most commonly used illicit drug.

An estimated 12.6 million people were current illicit drug users in 1991, and about 6.3% of the population 12 years of age and older had used illicit drugs. In 1991, 1 million people used crack cocaine, and its use among suburban populations had increased substantially. Addiction to crack cocaine has had disastrous implications in many minority communities. Crack-addicted women tend to neglect their children and when pregnant do not seek prenatal care. Babies born addicted to crack are more likely to have developmental problems and may be abandoned in the hospital, creating an additional burden on the public health care system.

The Federal Government seeks to increase individual knowledge of the adverse effects of drugs in order to reduce the loss of life and deterioration of health caused by alcohol and substance abuse. In the attempt to reduce substance abuse, the Government has appropriated US\$ 1,700 million during 1989–1991 to support key programs.

Oral Health

The common oral health problems, dental caries and periodontal diseases, remain highly prevalent in the United States. Since these diseases do not resolve without intervention, failure to take early action to prevent them or limit their effects results in needless pain, loss of teeth, and reduced oral function in speech and mastication.

Regular dental care is important in the treatment of a number of other oral diseases as well. For example, oral cancer, which affects primarily adults over 55 years old, results in over 8,000 deaths annually. Treatment of oral cancer is costly and may result in significant disfigurement and loss of function. Early detection and treatment can reduce both morbidity and cost. Work place or community-based strategies to eliminate use of tobacco could prevent many of the 30,000 new cases of oral cancer each year.

Although oral health status has been improving on average, especially in children, expenditures for dental services totaled US\$ 38,700 million in 1992, about 5.3% of all expenditures for personal health care. Ninety percent of that total was paid either "out-of-pocket" by consumers or through private dental insurance. It is important to note, however, that only 95 million people (40%) have such insurance.

Oral diseases and conditions can be easily prevented and controlled at reasonable cost. Prevention and regular primary dental care are the best strategies to improve oral health and quality of life. Certain barriers, especially cost, prevent many of the poor, the elderly, and those without dental insurance from seeking care.

Foodborne Diseases

Between 1973–1987, bacterial pathogens were responsible for 87% of the foodborne disease outbreaks of known etiology. Salmonella accounted for 42% of outbreaks and 51% of cases due to bacterial pathogens. Outbreaks due to *Salmonella enteritidis* have increased significantly over the past several years. Bacteria that

are particularly important as emerging foodborne pathogens include *Escherichia coli* 0157:H7, *Campylobacter jejuni*, and *Listeria monocytogenes*. Bacterial infections accounted for 90% of deaths due to foodborne disease.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Health Policies and Strategies

One of the most comprehensive U.S. policies currently in place to improve and prevent adverse health conditions is a strategic plan for public health called "Healthy People 2000." Central to this plan is the goal of increasing the number of people who live long and healthy lives; inherent in that notion is that long life must be accompanied by an increase in disability-free years. The second overarching goal of the plan calls for the elimination of disparities in health among population groups, and the third goal calls for achieving access to preventive services for all people.

In support of these three goals are 300 measurable objectives in 22 priority areas. Twenty-one of these priority areas fall into three broad categories: health promotion, health protection, and preventive services. One additional priority area cuts across all categories and addresses surveillance and data systems. Many of the objectives aim specifically at improving the health status of high-risk groups who bear a disproportionate share of disease, disability, and premature death compared to the total population.

"Healthy People 2000" lays out a prevention agenda for the next decade with measurable targets for improving health status, reducing risk factors for disease and disability, and improving health service delivery. The plan is a national consensus of health improvements that can be achieved through concerted public and private effort. This policy initiative is built upon the belief that medical care alone will not solve the health problems of society, but responsible behavioral choices on each individual's part will enable people to enjoy the benefits of a healthy life.

Expenditures and Financing

The U.S. health care system is heavily reliant on the provision of payment for medical care through private insurance. About three-quarters of the population is covered by private insurance provided by employers

or purchased individually; 14% of the population has no medical coverage at all.

A major problem facing the United States is how to develop a health care system that will cover all persons in need of medical care at a reasonable cost. Health care reform being initiated by U.S. policymakers will seek to create a system that integrates existing infrastructure with innovative mechanisms to expand treatment to the poor, the underinsured, and the uninsured. Because of the rising cost of health care and the large number of persons not covered by health insurance, health care reform has become a priority for the nation.

The Government operates two large public financing programs, Medicare and Medicaid. These programs funded 30.8% of all spending for personal health care in 1990 and accounted for 74.5% of the public share of health care financing. Medicare, created in 1965, was originally designed to provide services to people 65 and older. It was intended to protect them from the high costs of medical care. In 1972 it was expanded to cover other populations such as disabled workers and people with end-stage renal disease.

Unlike other Federal health programs, Medicare is not financed solely from the general revenue. In 1990, 89% of the hospital insurance portion of the benefit came from a 1.45% payroll tax levied on employers and employees. The Supplemental Medical Insurance portion of Medicare that covers physician services is financed through monthly premium payments by the 34 million beneficiaries.

Medicaid, also initiated in 1965, is a combined state-Federal program intended to provide services to the poor. The Federal Government determines broad eligibility guidelines and mandatory services. Individual states have the option of expanding the basic coverage package by offering additional services. In 1990, Medicaid provided services to 25.3 million people and had actual expenditures of US\$ 72,500 million.

Medicaid expenditures are mostly institutional, with 39.9% spent on hospital care and 33.8% spent on nursing home care. Medicaid is the largest third-party payer of long-term care expenditures, financing 45.4% of nursing home care in 1990. Poor Medicaid recipients received one-fourth of program benefits, while the blind and disabled, who account for only one-third of the Medicaid population, used three-fourths of the benefits.

In 1990 health care expenditures reached US\$ 675,000 million, and for the last 3 years they grew at a pace substantially higher than the overall economy. National health expenditures (NHE) were 12.2% of the gross do-

mestic product (GDP) in 1990, a substantial increase over the 11.5% figure for 1989. Medicare and Medicaid expenditures accounted for 28.0% of the NHE. The two programs financed 37.8% of hospital care and about 33% of physician services.

Food and Nutrition

Diet-related diseases such as coronary heart disease, cancers, strokes, and diabetes mellitus are leading causes of death and disability in the United States. Improvement of maternal and child nutrition is especially critical to improving national health. National nutrition objectives relate to obesity, diet and disease relationships, the application of the "Dietary Guidelines for Americans" to food service operations, dietary counseling, food labeling, nutrition education in schools, maternal and infant health, and feeding of older people. To achieve the nutrition objectives, particular attention will be focused on the following: food labeling reform and related nutrition education to facilitate consumers' application of the "Dietary Guidelines" in their daily eating patterns; assurance that meals in institutional settings, such as schools and day care, follow the "Dietary Guidelines"; and nutrition education, directed particularly to school-aged children, low-income populations, and medical professionals.

Food safety is principally a matter of protective systems and well-informed consumers. The national strategy for food safety involves four components: regulatory measures, including the promulgation of regulations to increase food safety; new model codes and technical support to the states and territories for use in the regulation of all food operations; implementation of surveillance systems to track the incidence of foodborne pathogens; and development of an educational strategy which includes communicating safe food-handling practices to consumers.

Environmental Health

Environmental factors play a central role in the process of human development, health, and disease. The most difficult challenges for environmental health today come from uncertainties about the toxic effect and ecological ramifications of the use of natural and synthetic chemicals, fossil fuels, and various physical agents. An estimated 82% of major industrial chemicals have not been tested for toxic properties or links to

specific diseases, and only a small proportion of chemicals have been adequately tested to determine whether they might cause or promote cancer.

Coordination of environmental health activities requires the participation of the Department of Health and Human Services, the Environmental Protection Agency, the Department of Agriculture, and the Department of Transportation at the Federal level, as well as state and local agencies, the private sector and community groups. The wide range of priority areas reflects the broad nature of the problems. For example, priorities include environmental health education, risk assessment programs for state health agencies, emergency response programs, and water/sanitation projects among migrant and rural people.

Health Research and Technology

Research. The Federal Government conducts, supports, and promotes biomedical and behavioral research and training through a vast network of extramural programs involving all the major universities and medical schools in the United States. Through the National Institutes of Health (NIH), the Federal Government supports nearly 40% of all biomedical research and development in the country. The highest funding priority is for basic research. This research investment has paid off in many achievements: new knowledge about the body, from the level of organ systems to that of subcellular components; important research and clinical technologies; new diagnostic techniques; new drugs to fight costly and distressing illnesses; and new vaccines to prevent disease. Through its training programs, NIH ensures a steady flow of young researchers into the biomedical research community. The total NIH budget for FY 1993 is approximately US\$ 10,000 million. Approximately 79% supports extramural research and training and 11% is for intramural research. In 1992, US\$ 1,000 million of the NIH budget was allocated to AIDS research.

Technology Transfer. An issue of increasing prominence in the United States is technology transfer. This issue involves the dissemination of research results, collaboration between publicly supported and industrial institutions on research and development projects, and licensing of intellectual property rights. Effective partnerships between government and industry enhance the capacity to conduct laboratory and clinical research, facilitate the translation of scientific discoveries into public health advances, and con-

tribute to economic growth. However, such collaboration also raises questions regarding how intellectual property derived from government-sponsored research is managed and how public investment should be reflected in the price of health care products. An example is management of the intellectual property derived from government-sponsored human genome research. The identification, localization, and sequencing of genes is a priority for biomedical research, and several genes associated with inherited disorders, such as cystic fibrosis and sickle cell anemia, have already been identified. Under the Federal Technology Transfer Act of 1986, NIH is encouraged to promote the translation of publicly funded research results into useful products. At issue is how best to carry out this charge in a manner that will facilitate both the free and open exchange of scientific information and the commercial development of important medical products. Gene sequence patenting and its potential effects on research, technology transfer, and international collaboration are the subject of a major comprehensive study undertaken by the Office of Technology Assessment. The study is due to be completed by July 1994.

One area in which NIH is virtually the only funding source, public or private, is contraceptive research, since product liability concerns have caused U.S. industry to abandon this field. The NIH program supports basic research on reproductive biology, research on sexual behavior and contraceptive decision-making, and a targeted program to develop and bring to market new contraceptive products. The current research focus is on development of several different types of products: an improved spermicide that also protects against HIV and other sexually transmitted diseases; a biodegradable long-term implant; skin-patch contraceptives; inhibitors of ovulation in women and sperm production in men; more effective condoms; safer estrogens and progestins; and contraceptive vaccines. NIH is working with industry on technology transfer efforts to garner support for research and to market products developed in the program.

Health Services Research. Increased emphasis is being placed on research to improve delivery of health services, patient outcomes, and assessment of health care technology. In FY 1993, US\$ 130 million was budgeted to support these activities. Government programs are testing assumptions on which current health policies and practices are based, examining new ways to organize, finance, and deliver health services, and improving health services research and health care

technology assessment methods. Two major programs for FY 1993 are described below:

- **Medical Treatment Effectiveness**, a research and information dissemination program, was established to improve the effectiveness and appropriateness of clinical practice. There are four program components: effectiveness research, development of clinical practice guidelines, development of data bases for research, and dissemination of research findings and clinical practice guidelines. Multidisciplinary teams of staff look at patient outcomes resulting from alternate strategies for the prevention, diagnosis, treatment, and management of clinical conditions. Ongoing studies are examining strategies to treat such conditions as low-back pain, cataracts, benign prostatic hypertrophy, and knee replacement, among others.
- **Health Care Costs, Quality, and Access Research** involves research projects and dissemination of research findings on these issues. Also included are medical technology assessment efforts and a User Liaison Program, a unique forum for disseminating research findings to Federal, state, and local policy makers.

Health Promotion

The success of the "Healthy People 2000" objectives depends on educational and community-based programs to promote health and prevent disease. Therefore, the objectives for these programs are aimed at reaching the public and improving health conditions outside of traditional health care settings. Many programs take a comprehensive approach to health and well-being, in recognition of the importance of addressing the social and physical environment in which behavior occurs.

The national strategy has three interrelated components: assessment, intervention, and leadership. The use of various intervention methodologies is being promoted among Federal, non-Federal, public, and private organizations. The National Association of Broadcasters and the American Hospital Association, with national organizations representing state and local health officials, will serve on the Educational and Community-based Programs Work Group.

The U.S. Public Health Service (PHS) provides the national leadership for health promotion activities, stimulating the formation of coalitions and working to develop stronger leadership at the state and local levels. PHS supports the implementation and improvement of health education for young people through cooperative agreements with relevant national, state, and

local education agencies, universities, and health departments. These cooperative agreements are intended to help prevent risk-taking behaviors associated with important health problems, including HIV infection. PHS conducts national surveys and helps state and local education agencies monitor how much health education schools provide and students receive. These surveys also monitor the extent to which high-school students engage in risk behaviors associated with leading causes of death and disability.

Surveillance and Data Systems

Health information is used to understand the health status of the population and to plan, implement, describe, and evaluate public health programs designed to control and prevent adverse health events. The

foundation for planning and evaluating the “Healthy People 2000” objectives for the nation is information and its analysis. Data must be accurate, timely, and available in a usable form to allow the successful tracking of the status of public health objectives.

The PHS has set national surveillance and data system objectives in order to improve the coverage and effectiveness of public health data systems. Key actions at the national level include the direct collection and compilation of data collected by other agencies; analysis and dissemination of health information about progress toward achieving the “Healthy People 2000” objectives by other Federal, state, and local agencies; assistance to state and local agencies in conducting public health surveillance and evaluation of data; and coordination of a Federal, state, and local surveillance network for diseases of public health importance.

URUGUAY

GENERAL HEALTH SITUATION AND TRENDS

Health and Living Conditions

The Republic of Uruguay's territory extends for 176,215 km². Politically it is divided into 19 departments, each with a semi-autonomous municipal government. The country is highly urbanized (89.3%), and 43.6% of the population resides in Montevideo.

The health situation in Uruguay is characterized by a sustained trend toward the aging of the population and a predominance of noncommunicable chronic diseases, which, coupled with the lifestyles that influence them, are the leading causes of morbidity and mortality.

From a socioeconomic standpoint, the effort to reorganize the productive process through a neoliberal approach, has led to the adoption of policies that encourage economic growth for its own sake. Social advances are viewed as a byproduct of economic development. The State and the economy are being reorganized in order to pave the way for the country's entry into the Southern Common Market (MERCOSUR) in the near future. In this context, the private sector is the principal driving force in the economy, and there is a trend toward privatization whose impact has been felt in the health sector.

This trend has manifested itself in the health sector's public subsector by the fact that the Ministry of Public Health has placed priority on regulatory and supervisory functions, rather than on being directly involved in the delivery of health services, as well as by the fact that health services have deteriorated because of budgetary constraints and the transfer of high-technology services to the private subsector.

The private subsector, in turn, has adopted a business-like approach to management, and new types of institutions with different forms of service delivery are emerging. Market criteria have begun to take precedence over the objectives of solidarity and equity in access to health care.

The Ministry of Public Health and the collective health care institutions (CHCI) provide health services for population groups of differing socioeconomic status. The Ministry, together with the teaching hospital at the University of the Republic, provides care free of charge or on a fee-for-service basis to the most disadvantaged segments of the population, while the CHCIs serve a population that ranges from extremely low-income workers to the most affluent members of the society. Infant mortality rate differences reflect this range. In 1981, the infant mortality rate among the population served by the Ministry was 50.7 per 1,000 live births, as contrasted with the national average of 33.4 and the rate of 13.4 among users of private services. Nevertheless, in recent years infant mortality has shown a downward trend among users of Ministry services and has remained stable among users of private services, with the rate among the former decreasing from 44.4 in 1984 to 24.1 in 1991, while that of the latter remained at 13.7. In 1992 the average infant mortality rate for the country was 18.7 per 1,000 live births.

In 1985 the Department of Statistics and Censuses, using data from the 1985 census, carried out an assessment of living conditions based on the index of unmet basic needs, and found that 27.6% of the country's population was living in homes with unmet basic needs. The percentage was higher in the country's interior (34.5%) than in Montevideo (19.0%).

With regard to economic variables, real wages increased by an average 3% during 1992 (a lesser increase than the 3.7% registered in 1991). This average increase was the result of a 4% increase in the private sector combined with a 0.72% decrease in the public sector. The decline in public sector wages was brought about by adjustment measures introduced in order to achieve a situation of balance, which were in line with the prevailing economic policy. Real minimum wages in urban areas have been falling since 1988, although the decline was less marked in 1992. Data from a household survey conducted in 1991 showed unemployment to be 8.9%, while underemployment was 5.7%, and these rates have tended to remain stable.

The country's gross domestic product (GDP) grew 7% in 1992, measured at 1980 price values—the highest

rate in the past 5 years. Per capita GDP was US\$ 3,643. The increase in consumer prices slowed, and inflation dropped from slightly over 80% in 1991 to under 60% in 1992.

Accrued interest on the foreign debt as a proportion of the total value of exports of good and services decreased for the fourth consecutive year, and in 1992 reached 16.9%, the lowest level since 1982. The total debt/exports coefficient dropped for the sixth consecutive year, reaching 325% in 1992. These two indicators point to a slightly favorable trend in the country's overall economy, although unevenly distributed between the public and private sectors.

Population

According to the latest census (1985), the population numbered 2,955,271. The literacy rate in 1985 was 95.7%; the birth rate was 17.6 per 1,000 population; the mortality rate was 10 per 1,000 population; and life expectancy at birth was 72 years.

In 1992, the total population was estimated at 3,130,500 inhabitants, of whom 1,366,331 (43.6%) lived in Montevideo and 1,764,169 (56.4%) lived in the rest of the country; 89.3% of the population was urban and 10.7% was rural.

Between the censuses of 1975 and 1985 the rural population shrank (a trend which continued in the years following 1985), with a net decrease in the population of the country's central departments and an increase in the population of border areas.

The age structure shows a clear trend toward the aging of the population, with a high and rising proportion of persons aged 65 and older and a decreasing proportion of persons under 15. This trend becomes obvious in the changes observed since the 1963 census, when 28.0% of the population was under 15 years of age, 59.7% fell in the 15–59 age bracket, and 12.3% was 60 years old and older. These proportions were 27.7%, 58.2%, and 14.1% in 1975 and 26.8%, 57.6%, and 15.6% in 1985. Later projections indicate that the trend has continued.

The low rate of growth in the central age groups relative to that of the group aged 65 and older has resulted in a deterioration of the ratio of potentially active population (aged 15–64) to economically inactive population. In 1985, the dependency ratio was 61.0, while in 1990 it was estimated at 59.7. Between 1963 and 1985, the ratio of potentially active population to dependent population over the age of 65 went from 8.4 to 5.5, which is indicative of the tremendous pressure

being placed on the country's social security system. The dependent population is made up primarily of elderly dependents, and this group can be expected to grow with the decline in fertility and the rise in life expectancy.

Fertility, which decreased during the first half of the century, remained stable from 1950 to 1975, and then began to decline again. The fertility rate for the 1985–1990 period was estimated at 2.43, and is projected to be 2.33 for the 1990–1995 period. At the same time, gross and net reproduction rates have fallen to close to replacement level; estimates put the net reproduction rate at 1.14 for 1985–1990 and 1.02 for 1990–1995.

Mortality

In Uruguay 100% of the deaths occurring anywhere in the country are registered, because the country's geographic features, cultural characteristics, and large number of physicians ensure access by all population groups to the death registry.

The 1879 Law on Vital Records is applied throughout the country. A death certificate is required for burial of the dead, and the Office of Vital Records requires a birth certificate signed by the birth attendant for registration of children. Ninety-nine percent of all births occur in a hospital and 100% are certified by a physician or university-trained midwife; accordingly, underregistration of births due to failure to register children is quite low (2.3%). The systems of death and birth registration have been operating since 1943 and 1977, respectively, under an agreement between the Ministry of Public Health and the Department of Vital Records.

In 1991, 100% of deaths were medically certified. "Signs, symptoms, and ill-defined conditions" accounted for 7.2% of the deaths overall, 10.0% in Montevideo and 2.4% in the rest of the country.

An analysis of proportional mortality by age for 1980, 1984, 1987, and 1991 shows a clear trend toward the relative reduction of mortality among children under age 5 (from 7.6% in 1980 to 4.3% in 1991); stabilization of the proportion of deaths in the group aged 5–44 (7.0% in 1980 and 6.4% in 1991); lower proportional mortality in the group aged 45–64 (from 22.2% in 1980 to 20.0% in 1991); and a sustained rise in the proportion of deaths among those aged 65 and over (from 63.2% in 1980 to 69.0% in 1991). The under-5 age group registered the greatest proportional reduction in mortality (43%) between 1980 and 1991.

The analysis of specific mortality rates published by PAHO for the 1960–1989 period shows a slight decrease in deaths from diseases of the circulatory system, infectious and parasitic diseases, and accidents, and a marked increase in mortality from malignant neoplasms.

The pattern of mortality from diseases of the circulatory system is similar for both sexes. The highest rates occur in the group aged 65 and older, among whom these diseases constitute the leading cause of death; this situation has tended to remain stable. Up to the age of 75, a greater number of males die from ischemic heart disease, whereas after the age of 75, more women die due to cerebrovascular disease. In the group aged 45–64, mortality rates are higher among males than females, and are associated with excess mortality from heart disease.

Between 1960 and 1989, death rates from malignant neoplasms among males 65 years old and over remained stable (around 1,800 per 100,000 population), whereas the rates among females showed a slight downward trend and were somewhat lower than the rates among males (1,078 during the 1965–1969 period and 994 during 1985–1989). In the group aged 45–64 the rates are higher among males than females, and a rising trend has been observed in recent years. The most frequent sites of malignancy are the colon, rectum, and breast. In the group aged 15–44, the rates have remained stable for both sexes and are lower than those in older groups. Among males the most frequent site of malignancy is the lung, and among women, the breast and uterus, in that order. In the 5–14 age group, 36 males and 25 females died due to malignant neoplasms during the period 1985–1990; cancer of the lymphatic tissue was the most frequent type.

Infant mortality continued to decline between 1988 and 1991, but did so at a slower rate. In 1992 the rate was 18.7 per 1,000 live births. The decline has been accompanied by a huge reduction in the death rates from intestinal infectious diseases (from 3.8 in 1980 to 0.7 in 1991), acute respiratory infections, perinatal conditions, and nutritional deficiencies. The number of deaths from accidents and violence increased from 33 in 1980 to 67 in 1991.

A comparison between infant mortality rates among Montevideo residents who use the services of the Ministry of Public Health and those among users of the CHCIs, reveals that in 1991, the risk among users of Ministry services was 2.5 times higher. In the case of postneonatal mortality, this difference is even greater—the rates among users of Ministry services are 4 times higher than among CHCI users. At the national level, the difference is smaller. In 1991, the infant and post-

neonatal mortality rates were 25.0 and 9.6 at Ministry establishments and at the university teaching hospital, compared with 13.8 and 4.1 at CHCI establishments.

Morbidity

With the exception of the mandatory disease reporting system, which covers infectious and occupational diseases, the country has no system that collects data on the morbid conditions treated at public and private health care facilities. The Ministry normally collects data on the causes for outpatient and inpatient care only for the population treated at its facilities (approximately 29% of the total), and these data suffer from underreporting and are not regularly processed.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal and Child Health

In 1991 the perinatal mortality rate was 21.1, with an early neonatal component of 9.6 and a late fetal component of 11.5; both components have tended to decline since 1977. Fetal mortality was lower than neonatal mortality up to and including 1982, but since that year it has been higher, which may be indicative of an overall improvement in environmental conditions.

The leading causes of hospitalization among children under 1 year old in hospitals of the Ministry outside Montevideo were acute respiratory infections (which accounted for 28.1% of all discharges in this age group) and intestinal infectious diseases (16.6%). Information on hospital discharges in the private subsector is lacking, but it is estimated that the situation is similar. The next most frequent causes were certain conditions originating in the perinatal period (8.9%), asthma (8.7%), otitis media and mastoiditis (2.2%), and injury and poisoning (2.1%).

In 1991, the mortality rate among children 1–4 was 0.80 per 1,000 population in this age group. The leading cause of death was accidents, with a trend toward rising mortality from this cause.

The death rate from malignant neoplasms in this age group decreased from 12.2 to 6.4 per 100,000 between 1985 and 1991. Leukemia was the leading cause among all malignant neoplasms. Deaths from congenital anomalies increased, with the rate rising from 8.8 to 11.3 per 100,000.

According to discharge records for 1990 from hospitals located outside Montevideo, acute respiratory infections were the leading cause of hospitalization (21.3%), followed by injury and poisoning (13.2%); bronchitis, emphysema, and asthma (10.2%); and infectious and parasitic diseases (8.8%). Of the hospitalizations from the latter cause, 81.7% were from intestinal infections.

In 1991, among children aged 5–9, 52.2% of the deaths were due to accidents (26 deaths, 37.7%) and malignant neoplasms (10 deaths, 14.5%). The most frequent types of accidents were traffic accidents (12 cases), followed by submersion and injury by firearms. Of the cancer deaths, five were due to leukemia and the rest to other types of cancer.

That same year, accidents remained the leading cause of death in the 10–14 age group, accounting for 44.3% of the total number. Malignant neoplasms were the second leading cause, accounting for 10 deaths, and suicides, the third, accounting for 6 deaths. In the group aged 5–14, injuries were the leading cause of hospitalization (accounting for 14.6% of all discharges), and acute respiratory infections were the second leading cause (10.2%).

Adolescent and Adult Health

Mortality among adolescent males is twice as high as that among adolescent females. This difference is accounted for by the higher number of male deaths from accidents, which cause more than 50% of all deaths and are the leading cause of death among adolescent males, with a rate of 56.5 per 100,000 population. Accidents also are the leading cause of death among females, but account for only 33.6% of the total number, and the rate of death is only 17.5. The most frequent types are accidental drowning and submersion (22.3% of the total), followed by firearm injuries, which caused 18 deaths (12.9% of the total) in 1991.

The second leading cause of death among adolescent males is suicide (12.8% of the total; rate of 13.5 per 100,000). Together, accidents, suicide, and homicide account for 72.1% of all male deaths and 45.6% of all female deaths. Also among the five leading causes of death are malignant neoplasms and diseases of the circulatory system, which account for a slightly higher percentage of female deaths.

Normal delivery accounts for 34% of all discharges from Ministry hospitals, followed by complications of pregnancy, childbirth, and the puerperium (16%); injury and poisoning (7.4%); and mental disorders (2.5%).

A study on drug use carried out in 1989 among 2,535 students aged 13–18 enrolled in secondary schools and at the Technical University of Montevideo showed that 17% smoked and 62.4% drank alcoholic beverages (drinking was more prevalent among males). Between 0.5% and 1.2% used drugs to lose weight, feel good, or stay awake; 3.3% had tried marijuana and only 0.8% had tried cocaine.

Twenty-five percent of all deaths of both males and females occur in the 25–64 age group, but the rates among males are 2.3 times higher than those among females, and they rise with age. The risk of dying is higher among males at all ages.

In the group aged 25–34 there is excess male mortality from all causes (except cancer), but especially from accidents. The risk of accidental death among males is seven times higher than among females. The suicide rate is also higher among males (3.5 times).

Among those aged 35–54 the leading cause of death is malignant neoplasms and the second leading cause is diseases of the circulatory system. The specific mortality rate is 2.3 times higher among males than among females, which is explained by the fact that for the two leading causes (cancer and diseases of the circulatory system) the rates among males are twice as high as those among females. The rates of accidental death also are higher (81.1 and 27.4 per 100,000, respectively), as is the mortality rate from cirrhosis (55.0 and 11.6, respectively).

The leading cause of hospitalization at Ministry hospitals is diseases of the circulatory system, which account for twice as many discharges as cholecystitis and cholelithiasis (the second leading cause) and malignant neoplasms (the third leading cause).

Health of Women

In 1992, women represented 51.3% of the population; 14% were 64 years old or older, compared to 12.3% in 1985.

The leading cause of death among women is diseases of the circulatory system. Within this group of causes, the leading cause is cerebrovascular accident, with especially high rates among women aged 65 or older. The next leading cause of death is breast cancer, with an obvious rising trend in rates. Accidents are the third leading cause, but are responsible for a much lower number of deaths than the first two causes. Acute respiratory infections and pneumonia constitute the fourth leading cause of death, and mental disorders rank fifth, with rising rates. Among women, mortality from diabetes is higher than among men.

The maternal mortality rate fell from 5.1 per 10,000 in 1980 to 3.8 per 10,000 in 1991. In 1990, the Program on Maternal and Child Health began to require auditing of all maternal deaths. During the first year a rise was noted in the number of deaths classified as maternal deaths, from 9 in 1990 to 21 in 1991, with an increase in the rate from 1.6 to 3.8 per 10,000. This rise was attributed to the increased incentive to correctly certify maternal deaths; nevertheless, for every known maternal death it was estimated that there were 2.2 maternal deaths not registered as such, which signifies underregistration of more than 50%.

Of all births in the country, 99% take place in an institutional setting; 21% are by cesarean section (ranging from 12% in establishments of the Ministry of Public Health to 29.4% in CHCI establishments).

Health of the Elderly

The percentage in total mortality of the age group 65 years and older has shown a rising trend that has been more marked among females. Diseases of the circulatory system represent the leading cause of death among the elderly, and within this group of causes, ischemic heart disease ranks first in the group aged 65–79, while cerebrovascular disease is first among those over 80.

Malignant neoplasms are the second leading cause of death. The most frequent site of malignancy is trachea, bronchus, and lung among those 65–79 and colon among those 80 and older. Accidents were the third leading cause of death among those aged 65–69 (2.7%) and fifth among those older than 69, except in the group aged 80–84, among which accidents ranked below fifth. Diabetes ranks between third and fifth place.

Diseases and Health Impairments

Vector-borne Diseases

Uruguay has had no cases of malaria, dengue, plague, schistosomiasis, or yellow fever. Nevertheless, there are ongoing activities for the surveillance of yellow fever and for control of the vector *Aedes aegypti*.

Chagas' disease is endemic in the country. Household infestation with the vector *Triatoma infestans* has been found in 13 departments in the northern part of the country. The control program has succeeded in controlling the vector in broad areas, totally eliminating it in two departments, and reducing household infestation in the rest. Based on data from a national

serological survey carried out in 1985, it was estimated that the prevalence rate in the entire area of vector transmission was 3.4%. The objective of the program is to interrupt human transmission of the disease.

Vaccine-preventable Diseases

No cases of poliomyelitis, neonatal tetanus, or diphtheria have been reported for more than 10 years.

Measles has occurred very infrequently, although there have been two recent epidemic outbreaks—one in 1987, with 1,190 reported cases and a case-fatality rate of 10.1 per 1,000, and the other in 1991, with 2,040 cases and a case-fatality rate of 1.5 per 1,000.

In 1987, whooping cough caused five deaths, with a rate of 13.0 per 1,000.

Cases of tetanus are underreported, as evidenced by the fact that in 1986, 1988, and 1990 there were more deaths from this disease (2–9 deaths) than there were reported cases.

Cholera and Other Intestinal Infectious Diseases

As of June 1993 no cholera cases had been reported in Uruguay.

Since 1986, infant mortality from diarrhea has been lower than mortality from acute respiratory infections. Viral hepatitis and typhoid fever are endemic in the country, although the rates of occurrence are markedly different (in 1992 there were 638 reported cases of hepatitis, compared to 4 of typhoid fever).

Chronic Communicable Diseases

The estimated death rate from tuberculosis was 2.8 per 100,000 in 1986 and 2.6 in 1991. Tuberculosis morbidity decreased from 28.6 per 100,000 in 1970 to 13.2 in 1992. The biggest reduction (52.5%) was in the 0–14 age group and the smallest (3.7%) was among those aged 60 and over.

The number of leprosy cases reported in 1991 was 249, for a prevalence rate of 0.84 per 10,000.

Rabies, Foot-and-Mouth Disease, and Other Zoonoses

No cases of human or canine rabies have been reported in the past 10 years.

As of March 1993, it had been 33 months since any foci of foot-and-mouth disease were detected, and the

country was declared disease-free with continued vaccination.

Hydatidosis is a widespread zoonosis in Uruguay, not only in rural areas but also in urban areas as a consequence of the illicit slaughtering of animals and the many stray dogs. Between 30,000 and 40,000 persons (more than 1% of the total population) are carriers of one or more hydatid cysts.

AIDS and Other Sexually Transmitted Diseases

As of the end of 1992, a total of 335 AIDS cases had been reported, most (76.6%) in the capital. The 20–49 age group is the most affected.

Sexual transmission accounts for more cases (76.6%) than transmission through blood or blood products (20.8%), and perinatal transmission is still rare (2.6%). Of the cases acquired through sexual transmission, the greatest proportion (48.7%) have occurred among homosexuals, while of those acquired through blood or blood products, most (90.4%) have been among intravenous drug users. The vast majority of AIDS patients are males, although the number of cases among females has been slowly rising.

Nutritional and Metabolic Diseases and Deficiencies

The daily availability of calories and proteins per person is higher than the estimated mean amount needed. There is high mean availability of fats of animal origin (meat, milk, and milk products), which supply 34.6% of total caloric intake.

The Ministry of Public Health's Department of Nutrition, through the Nutritional Status Surveillance System, collects information on the population under the age of 5 treated at Ministry health care facilities. According to information from 1991, out of 16,937 children under 5 treated between 1987 and 1989, 18.2% overall (15.5% of those under 1 year and 21.9% of those aged 1 to 4 years) were underweight. When the indicator height-for-age was applied, the situation was more serious, as 30.8% of the children showed growth retardation.

Endemic goiter has been controlled thanks to programs carried out between 1963 and 1980. Vitamin A deficiency is not a problem in the country.

Overweight is highly prevalent among the adult population; 47.0% of males and 57.8% of females show some degree of overweight or obesity.

Diabetes is the fifth leading cause of death, with a rate of 19.4 per 100,000 population. Although this rate

has tended to remain stable, an analysis by age group reveals that mortality from diabetes rises with age, beginning at age 55.

Cardiovascular Diseases

Cardiovascular diseases are the leading cause of death, accounting for 38% of the total number. Of all the deaths from this cause, 80% occur among the population aged 60 and older. Ischemic heart disease and cerebrovascular disease together account for more than 63% of all the deaths attributed to cardiovascular diseases.

Malignant Neoplasms

In 1991, lung cancer was responsible for the greatest proportion of all cancer deaths among males. It was followed, in proportional terms, by cancer of the prostate, rectum and colon, stomach, and esophagus. Among females, breast cancer caused the most cancer deaths, followed by cancer of the rectum and colon, stomach, corpus and other parts of the uterus, and pancreas.

The death rate from breast cancer, which ranks high as a health problem, was 36.7 per 100,000 in 1990, and this cause was responsible for 20% of all cancer deaths among women in that year. In 1990, lung cancer caused 26% of all cancer deaths among men, with a crude death rate of 72.0 per 100,000 population.

Accidents and Violence

Accidents are the third leading cause of death, accounting for 4.7% of all deaths in 1991, with a death rate of 45.2 per 100,000. They are the leading cause of death among the population between the ages of 1 and 29, and are responsible for 28% of all deaths of children aged 1–4 and 50% of all deaths of adolescents aged 15–19. More males than females die from this cause in all age groups, except in the group aged 1–4. Proportional male mortality is highest (58.3%) in the group aged 15–19.

Behavioral Disorders

No direct information is available on alcoholism. In a survey conducted among adults affiliated with a CHCI that covers 10% of the population, 28.6% of those over the age of 18 reported that they drank alco-

holic beverages. One indirect indicator of alcoholism is the trend of the death rate from cirrhosis of the liver, which rose from 8.5 per 100,000 population during the 1986–1991 period to 10.0 in 1991. A markedly greater proportion of males die from this cause and mortality increases gradually with age.

Since 1986, mental disorders have figured among the 10 leading causes of death. Mortality from this cause increased more than twofold (2.5) between 1984 and 1991, rising from 7.2 per 100,000 to 18.1, with a substantial increase among those 75 and older and with higher rates among women in that age group.

Oral Health

The most prevalent diseases, dental caries and periodontopathies, are responsible for most cases of tooth loss. The decayed, missing, and filled teeth (DMF) index is around 4 at 12 years of age.

Although the dentist/population ratio (1 dentist per 980 population) appears to be favorable for good dental care, it is not possible to control diseases of the oral cavity solely through curative or restorative treatment.

Risk Factors

There is no information that makes it possible to know the extent to which air pollution poses a health hazard in Uruguay.

The country has no program for the surveillance of foodborne diseases or any information system on such diseases, although the municipal government of Montevideo conducts surveillance for *Vibrio cholerae* in markets.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Health Policies and Strategies

The health sector complex is made up of widely varying institutions that function with little coordination. Basically, the sector is composed of two subsectors—the mutual private subsector and the public sector, which is headed by the Ministry of Public Health. The country's health policies are oriented toward addressing the principal health problems. Priority is given to health care programs for adults and the control of noncommunicable chronic diseases.

Organization and Administration of Institutions in the Sector

The organization of health services reveals a trend toward decentralization, although little headway has been made in this direction because the country is so centralized. Local health systems have not been developed.

Human Resources

There is no explicit policy on human resources. The surplus of doctors, coupled with privatization policies, has given rise to alternative modalities for the delivery of medical care and has led to the emergence of the figure of the physician as a businessman.

In contrast to the surplus of doctors, there is a persistent and increasingly pronounced shortage of nursing personnel. In response to this situation, the School of Health under the Ministry of Public Health has created a program to train personnel at an intermediate level between nursing auxiliaries and professional nurses. The first class will graduate in 1994.

Spending on Health

There has been no significant increase in spending on health, which has impeded the public subsector's growth.

In the private subsector, although government regulations on some health-related products, such as drugs (1992–1993), and on prepaid health insurance premiums have been lifted, this deregulation is only nominal, since in practice the State continues to authorize and regulate price increases in order to control inflation.

It is estimated that in 1991 spending on health amounted to 8.0% of the GDP. Of that percentage, 34.3% corresponded to the public subsector and 65.7% to the private subsector. The amount expended by the Ministry was 14.4% of total spending (42% of public spending on health) and 22% of private subsector spending.

Physical Resources

In the public subsector, the physical resources available for health care are deteriorated and obsolete, and the renovations carried out in some hospitals and

health centers have not been able to offset this situation. In the private subsector, a greater percentage of physical resources have been repaired and expanded, and new outpatient and inpatient facilities have been constructed.

Food and Nutrition

The Ministry of Public Health, which serves the critically poor population, has made control of severe malnutrition one of its priorities and, to that end, conducts supplementary feeding programs.

Drugs and Immunobiologicals

There has been no change in the country's policy regarding the introduction and registration of new drugs and biologicals, and there is no legislation on patents. Screening for HIV is required for immunobiologicals.

Diagnostic and Treatment Resources

The Ministry of Public Health regulates the use of technology in terms of the quality and maintenance of equipment. Little research or development has occurred in the area of health technology.

Priority Programs and Population Groups

In 1990, the country's health policy was reoriented to bring it into line with the prevailing health problems, and priority was assigned to adult health and to noncommunicable chronic diseases.

Priority Program on Geriatrics. Given the growth of the population over the age of 60, a program on geriatrics was established in 1991. The program aims at prolonging healthy life through the standardization, coordination, integration, and supervision of all medical and social services concerned with the process of aging and with old age as a stage of life. It includes activities to promote health and prevent the diseases that accelerate the process of aging, and, as a way to avoid isolating the elderly and to help them remain a part of their families, activities aimed at encouraging self-care and the personal, familial, occupational, and social integration of older persons, as well as their creativity and participation.

Occupational Accidents and Diseases. Law No. 16,074, enacted in October 1989, establishes employers' liability for occupational accidents and diseases, and requires insurance against the diseases and accidents included under the law. This law is applied through the provision of insurance coverage for prevention, compensation, medical care, and rehabilitation. In regard to prevention, intensive campaigns are carried out to identify and assess risks and to promote the application of methods and procedures in the workplace that are in line with current standards. Medical care and rehabilitation services are rendered through a complex structure with national coverage, which treats a wide range of medical/health problems experienced by workers. Occupational health services are provided at the sanatorium operated by the State Insurance Fund in Montevideo, and services are contracted out to CHCIs elsewhere in the country.

Cardiovascular Diseases. In 1991, the health authorities included the program for control of cardiovascular diseases among the sector's priority programs. The control program includes activities oriented toward health promotion and disease prevention, as well as diagnosis and treatment.

Breast Cancer. In 1991, the Ministry established the breast cancer control program as one of its priority programs. The program seeks to reduce breast cancer mortality through early detection of the disease and systematic screening. Its strategies are education of the female population on the most important aspects of breast cancer, promotion of breast self-examination, and training of medical personnel in the principal technical aspects of diagnosis and treatment of the disease. As of June 1992, the program had been implemented at 78 public and private health care centers; however, a study of 47 health care units showed the level of preventive care coverage to be very low (around 1% of the women served).

Lung Cancer. The lung cancer control program focuses exclusively on smoking control and promotes measures aimed at discouraging the habit through education, restrictions on advertising, and publicity campaigns designed to combat tobacco advertisements. Activities also are carried out to encourage people to quit or cut down on smoking. To this end, the Ministry has established a smoking cessation program that offers support for smokers seeking to give up the habit and is open to the entire population.

Traffic Accidents. Prevention of traffic accidents is another of the Ministry's priority programs. The risk factors most closely associated with traffic accidents are alcohol consumption and drug abuse. Nevertheless, the country has yet to enact legislation setting limits on blood alcohol levels for drivers of motor vehicles. Pedestrians are at highest risk, and although persons of all ages are involved in accidents, the youngest and oldest age groups are most affected. The program emphasizes health promotion and specific preventive measures through media campaigns aimed at the general population and at specific risk groups.

Oral Health. In 1986, a subprogram to provide dental care for schoolchildren was established as part of the Ministry's oral health services. The introduction of this subprogram represented a major shift in emphasis, from coverage only for spontaneous demand for treatment of pathological and emergency conditions to a model of care geared toward a specific risk group, involving activities in the community and that have a strong educational and preventive component. In 1991, the salt fluoridation program was implemented as the first mass program for the prevention of caries.

Priority Eye Care Program. This program was implemented in 1992 with the principal objective of eliminating blindness resulting from preventable and curable causes (cataract and blindness in children).

Hydatidosis. The Honorary Commission to Combat Hydatidosis was created in 1985, and a law enacted in 1990 gave the Honorary Commission the necessary technical, administrative, and financial autonomy to function throughout the country. At the same time, the Ministry established the national program for the control of hydatidosis-echinococcosis in Uruguay and included it among its priority programs. The program's objective is to reduce the risk of hydatidosis and control the endemic nature of the disease in Uruguay through activities aimed at decreasing the prevalence of the infection in the canine population and in sheep and cattle.

Health Promotion

The health promotion strategy is an important part of the actions planned under the various disease control programs. Health education and mass communication activities are particularly emphasized.

Health Legislation

The primary basis for health legislation is the country's constitution, which was enacted on 1 February 1967 and remains in effect. The Ministry of Public Health's functions are set forth in the organic law established on 12 January 1934.

Law 15,181 of August 1981 provides for the creation of collective health care institutions (CHCI), and Decree 88/983 of March 1983 regulates investments made to finance the delivery of health care services by those institutions. Statute 32/89 of November 1989 establishes regulations concerning the partial health insurance plans offered by private health care institutions.

Law 14,897 of May 1979, which is regulated by Decree 36/980 of January 1980, provides for the creation of highly specialized medical institutes for the care of patients with conditions whose diagnosis and treatment require a high level of technical specialization and imply high start-up and maintenance costs. To finance this infrastructure, the National Resources Fund was created with funds from the State, the CHCIs, autonomous entities, decentralized services, and *municipios*, as well as funds contributed by persons who receive medical care.

Organization of Services

Personal Health Care Services

Infrastructure. The health sector is made up of public and private health service institutions.

The public subsector comprises the Ministry of Public Health and the State Health Services Administration (ASSE); the teaching hospital (*Hospital de Clínicas*) of the University of the Republic; the health services of the armed forces; the State Insurance Fund; the police health services; the Social Welfare Fund; municipal governments; and decentralized agencies and autonomous entities that provide health services.

The Ministry leads, regulates, and controls the sector as a whole. It also provides health services to the low-income population through a network of health care establishments distributed throughout the country.

The State Health Services Administration, created in 1987, is a decentralized agency under the Ministry, whose function is to administer the health services that had been directly administered by the Ministry until the Administration's creation. The resources overseen by the ASSE include 61 health care establishments distributed throughout the country and 8,553 beds in hos-

pitals for acutely and chronically ill patients and in specialized institutes.

The university teaching hospital (*Hospital de Clínicas*), which has 700 beds, provides third-level care free of charge to the population served by the Ministry and on a fee-for-service basis to the rest of the population. The police health services, with 70 beds available, and the armed forces health services, with 447 beds, provide care for members of the police and military forces and their immediate families. The State Insurance Fund, which provides coverage to workers for occupational accidents and diseases, has 160 beds available.

Workers in the private sector have mandatory health insurance through the Department of Social Health Insurance, under which they are affiliated with the CHCI of their choice and receive comprehensive health care coverage. The principal failing of this system is that workers' dependents are not covered. In case of unemployment, workers continue to be covered under unemployment insurance for a period of approximately 6 months.

The Department of Family Allowances within the social security system provides coverage for pregnant workers or spouses of workers (for pregnancy and childbirth) and their children under the age of 5. The Department operates its own services in Montevideo, and contracts with the Ministry or CHCIs for the delivery of services elsewhere in the country.

The municipal governments provide outpatient services to the general population. The autonomous entities and decentralized services have medical services for their employees.

The network of CHCIs is composed of institutions that offer health insurance to a circumscribed population (or affiliate population) and provide—through their own establishments or through other health care establishments under contract—most of the health services required by that population. Affiliates pay a voluntary individual or collective fee, or the fee is collected through the social security system. As of 1991, the country had 52 CHCIs delivering health services in specific geographic areas. The CHCIs are independent institutions that compete among themselves, and although they are nominally controlled by the executive branch of government through the Ministry, they are in fact private entities that enjoy a high degree of organizational and operational autonomy.

According to information obtained in 1991 through the ongoing household survey by the Department of Statistics and Censuses, the Ministry serves 28.8% of the country's total urban population and the CHCIs serve 54.5%, which reveals the importance of the col-

lectivized private sector in the delivery of health care in Uruguay. The Ministry plays a larger role in health care delivery outside of Montevideo, where it serves a proportion of the population similar to that served by the CHCIs. In Montevideo, two-thirds of the population is served by CHCIs. The proportion of the total population lacking any health care coverage (i.e., without any formal ties to any health service) is 6.8%.

Partial insurance plans are another form of prepaid health insurance that cover only certain risks (transfer to and care at special units, surgery, etc.). Several such plans are available, ranging from those that provide coverage for more comfortable accommodations to those designed to provide coverage at the lowest cost for the least affluent members of the population.

A relatively small number of noncollective private medical institutions sell services (especially inpatient services) to other institutions in the private subsector, mainly to the CHCIs.

Liberal private practice accounts for a very small proportion of the health services provided in the country. These services are mainly oriented toward satisfying the demand of the social segments with the greatest purchasing power and toward the performance of specific diagnostic and therapeutic procedures.

As discussed previously, Law 14,897 created highly specialized medical institutes. Practically since its inception and up to 1991, the National Resources Fund covered medical services relating to heart surgery and hemodynamic studies, implantation of simple pacemakers, treatment of chronic renal insufficiency, kidney transplant, and hip prostheses. In March 1992 the Fund also began to provide coverage for coronary angioplasty, comprehensive treatment for renal lithiasis (excluding surgery), knee prostheses, and implantation of more sophisticated pacemakers.

The Ministry heads the Administrative Commission of the National Resources Fund and authorizes the creation and equipping of new, highly specialized medical institutes.

General revenues finance 97% of the services provided by the Ministry of Public Health and the university teaching hospital, 83% of the health services of the Ministry of Defense, and 75% of those of the Ministry of the Interior.

The CHCIs, which function as health insurance firms offering prepaid services, are financed in various ways: by contributions from individual affiliates, by contributions from employers' health insurance plans (collective affiliations) through transfers from the social security system, by the sale of vouchers to service users, and through the sale of services.

As of March 1993, the monthly contribution to CHCIs per affiliate was approximately US\$ 25, in addition to the surcharge for investments, payment for vouchers, and contributions to the National Resources Fund.

The establishments operated by the Ministry, which are distributed throughout the country, coordinate health care delivery among themselves and refer patients among the various levels of care and complexity. The establishments in Montevideo and in the department capitals throughout the country provide services to patients referred from less complex peripheral establishments. There is no such coordination among other institutions of the public subsector, or between those of the public and private subsectors. As a result, services in a given locality may be duplicated or underutilized.

In 1988, the local health system strategy provided an impetus for local coordination between public and private institutions, although since that time coordination has been limited to a few individual initiatives.

Coverage. In 1991, a total of 122,941 patients were discharged from Ministry establishments following treatment for acute illness, 37,623 of them in Montevideo (an index of 188 discharges per 1,000 covered population). It should be noted that the hospitals in Montevideo, because they are generally equipped to provide complex care, serve as national referral centers and receive patients from the rest of the country. Outside of Montevideo, the index was 134.2 discharges per 1,000 covered population (figures adjusted to exclude discharges corresponding to the rural population).

Among the population covered by CHCIs, the index was 100.6 discharges per 1,000 affiliates.

In 1991, Ministry establishments logged 3,732,005 outpatient visits, which amounts to 6.3 visits per covered person in Montevideo and 4.1 visits per covered person in the rest of the country (adjusted to exclude the rural population). The figure for the CHCIs was 5.5 visits per affiliate.

In Uruguay, the vast majority—around 96%—of births occur in institutional settings (in 1990, the figure was 99%).

Among the cohort of children under the age of 1 in 1991, the national average coverage for the triple vaccine against measles, mumps, and rubella (MMR) was 84%; for DPT and the polio vaccine, coverage was 90%. In 1992, MMR vaccination before the age of 1 was discontinued. The vaccine is now given after the age of 12 months, with a second dose at 5 years of age.

Patients with acute psychiatric disorders requiring hospitalization receive care at establishments of the

Ministry and at private institutions, while chronically ill mental patients receive inpatient care only at Ministry establishments. The CHCIs cover hospitalization for patients with acute psychiatric conditions for up to 30 days per year at no cost. After that period, the patient is required to cover the cost of hospitalization or be transferred to a Ministry establishment.

Environmental Services

According to the 1985 population and housing census, between 80% and 85% of the population had access to drinking water and 50% of the dwellings in the country were connected to the General Sanitation System; only 4% lacked any type of wastewater treatment. Between 1987 and 1992 the population served by house connections increased from 2,163,000 to 2,537,000 (88% coverage), and that served by sewer connections increased from 349,000 to 409,000.

In 1992, the contamination of beaches in the city of Montevideo with coliform bacteria was controlled through the construction of a collector, which represented a major investment for the city government.

The departmental governments are responsible for collection and disposal of refuse in sanitary landfills.

Available Resources

Human Resources

The number of physicians has been rising for approximately the past 20 years. In 1991, there were 10,217 physicians (34 per 10,000 population for the country as a whole), with a greater concentration in Montevideo (8,202) than elsewhere in the country. There also has been an increase in the number of specialists and in the percentage of women in the profession.

The profile of dentists is similar to that of physicians, with a ratio of 12 per 10,000 population (3,596 dentists overall, 2,773 of them practicing in Montevideo).

The supply of professional nurses is not as great, the ratio of nurses to doctors is inadequate, and the profession shows less of a trend toward growth (there are 1,774 professional nurses, 1,474 of them in Montevideo).

Health professionals (physicians, dentists, midwives, nutritionists, professional nurses, etc.) are trained at the University of the Republic. Auxiliary personnel are trained at the School of Health administered by the Ministry of Public Health. For the train-

ing of nursing auxiliaries there are also private schools, the quality of which varies, although the curriculum is standardized and supervised by the School of Health.

No school of public health exists in the country. Training in this area is offered through the Graduate School of the College of Medicine.

Physical Resources, Equipment, and Supplies

The country has 13,812 hospital beds—9,985 in the public subsector and 3,827 in the private subsector, with a ratio of 4.4 beds per 1,000 population. The largest proportion (61.9%) of these beds belong to the Ministry, which is the only health sector institution that provides inpatient care for chronically ill patients. The CHCIs, together with the noncollective private medical institutions, have 27.7% of the available beds. The remaining 10.4% are at the university teaching hospital and at other public hospitals.

In 1991, the bed occupancy rate at Ministry establishments was 83.6% in Montevideo and 49.2% elsewhere, for an average of 69.3%. The average hospital stay per patient was 35.5 days in Montevideo (including both acutely and chronically ill patients) and 7.1

elsewhere (including only acutely ill patients), for an average of 16.2. In Montevideo, patients at establishments for the acutely ill stayed an average of 14.2 days. The Ministry's differing profile becomes apparent when it is observed that in Montevideo the hospitals for chronically ill patients account for 60% of the beds available and 63% of total patient-days but only 7% of all discharges. The average hospital stay in the private subsector is 4.5 days.

Some clinical laboratories form part of public or private establishments; others are private and sell their services to institutions or individuals. Since 1978, laboratories have been regulated by the executive branch of government and are registered with the Ministry of Public Health.

The use of X-ray equipment in health care establishments is coordinated and supervised by the Advisory Commission on Electroradiology and Nuclear Medicine.

The country's blood banks are equipped, coordinated, and supervised by the National Blood Service, established in 1953 as an agency under the Ministry. There are 20 hemotherapy services. Blood donors receive no monetary compensation, and all donated blood is screened for syphilis, hepatitis B, AIDS, and Chagas' disease.

VENEZUELA

GENERAL HEALTH SITUATION AND TRENDS

Venezuela is a federal republic composed of 23 federative entities that are divided into 286 *municipios* (geopolitical units), which, in turn, are subdivided into 962 parishes or capital *municipios*. The 1989–1993 period was characterized by an intensive administrative decentralization, which has had significant repercussions, especially on the health sector. As part of this process, in 1989 the governors of 22 states and the mayors of the *municipios* were chosen by direct election for the first time in the country's history; the second elections for these offices took place in 1992.

This same period saw the initiation of an economic adjustment process and a restructuring of the external debt, accompanied by the implementation of compensation programs designed to reduce the impact of adjustment on the most vulnerable segments of the population. This period witnessed extremely high inflation—higher than at any other time in the country's last 40 years—with growth in the gross domestic product (GDP) and increased concentration of income. Inflation rose from 29.5% in 1988 to 84.5% in 1989; it dropped to 40.7% in 1990 and fluctuated between 30% and 35% in 1991 and 1992. The GDP, which decreased by 8.6% between 1988 and 1989, grew by 10.4% in 1991 and by 7.3% in 1992. Structural and cyclical economic problems have directly affected health services delivery, especially in terms of the quality of health care and changes in certain indicators. The period was marked by serious civil uprisings (1989), military insurrections (1992), and growing insecurity at the national level, especially in large urban areas.

Health and Living Conditions

The cholera epidemic struck the country in December 1991, and in the following 12 months, it spread throughout the country. The epidemic has highlighted sanitation problems and poor living conditions affect-

ing various segments of the population, especially in rural and marginalized urban areas.

Several recent studies on the extent of poverty in the country have shown that living conditions have worsened in the past few years. More than in absolute terms, this deterioration has become evident in the widening of differences between population groups. A more recent study that split the population into five groups concluded that the first group, the group enjoying the best living conditions, comprised only 1.07% of the population; the second group, the "middle class," constituted 7.09%; the third group, the "working class," made up 13.65%; and the fourth group, the "working poor," represented 37.85%. The fifth group, those living in "critical poverty," included 40.34% of the population—the largest group in the country. One-third of the fifth group, or about 14% of the total population, was found to be living in "abject poverty."

If the percentages of inhabitants with unmet basic needs (UBN) are used to classify the parishes of the country into 10 groups (the first having between 0% and 9% of the population with UBN and the 10th having between 90% and 100%), it is evident that mortality patterns differ markedly according to living conditions. For example, infant mortality is 2.5 times higher in the group with the worst living conditions than in the first group, mortality from communicable diseases is 3 times higher, and mortality from perinatal causes is 6 times higher. The rates of death from cardiovascular disease, malignant neoplasms, external causes, and other causes are comparable for the two groups, with variations of around 20%. Almost all the neonatal tetanus cases recorded in recent years have occurred in groups in which 70% or more of the population has unmet basic needs.

Population

The total estimated population in 1992 was approximately 20,249,000, with a population density of 22.4 inhabitants per km². Despite an intensification of population shifts toward some areas of the Orinoco River

basin in recent years, the population remains concentrated along the coast and in the Andean area. Of the total population, 17.4% is concentrated in the Caracas metropolitan area and 33.4% in four other states (Zulia, Carabobo, Lara, and Aragua), with a population density in this area of 108.6 inhabitants per km².

According to the 1990 census, only 15.9% of the population lives in rural areas, while 71.5% lives in urban areas of 50,000 or more inhabitants. The population is predominantly young, with the group aged 0-4 accounting for 13.0%; the group aged 5-14, for 24.3%; the group aged 15-24, for 20.1%; and the group 65 or older, for only 4.0%.

The country's indigenous population numbers more than 314,000 (1.55% of the total). This population lives mainly along the borders with Brazil, Colombia, and Guyana.

The geometric population growth rate during the period between censuses (1981-1990) was 2.5%, lower than the rate of 4.0% registered during the 1950-1961 period, a downward trend that is attributable to declines in the birth rate, mortality, and migration. The birth rate fell from 43.7 per 1,000 population during the 1960-1965 period, to 29.9 in 1990. The total fertility rate in that year was 3.58. Mortality decreased from 7.1 per 1,000 population during the 1960-1965 period to 4.65 per 1,000 in 1990. With regard to immigration, the foreign-born population, which grew by 484,000 persons between 1961 and 1981, decreased by almost 49,000 between 1981 and 1990, owing in large part to the economic crisis that began in the 1980s. The number of births registered was approximately 504,000 in 1986, 517,000 in 1987, 522,000 in 1988, 529,000 in 1989, and 578,000 in 1990. The increase for the last year reflects a rise in the registration of births, as a result of a require-

ment that births be registered in order for children to be eligible to receive benefits from certain social welfare programs.

Mortality

The crude death rate, which in 1991 was 4.70 per 1,000, has fluctuated very little over the past 10 years. No studies have been conducted at the national level to determine the degree of underreporting of deaths, but CELADE estimates for the 1985-1989 period put the rate at 5.4 per 1,000, which would indicate 13% underreporting; according to experts in the country the figure is close to 10%.

The 10 leading causes of death for 1989 and 1991, according to the classification of causes used by the Ministry of Health and Social Welfare, were as follows: heart disease (ICD-9, 393-396, 402, 404, 410-429), which accounted for 17.7% of all deaths in 1991; malignant neoplasms (140-296, 230-234), which accounted for 11.9%; accidents (E800-E949), which represented 8.8%; certain conditions originating in the perinatal period (760-769), which were responsible for 7.3%; cerebrovascular disease (430-438), which accounted for 6.6%; pneumonia (480-486), which caused 3.8%; suicide and homicide (E950-E969), which accounted for 3.2%; diabetes mellitus (250), which accounted for 3.2%; intestinal infectious diseases (001-009), which were responsible for 2.7%; and congenital anomalies (740-759), which accounted for 2.2%. The ranking of these groups of causes changes substantially when they are analyzed in terms of years of potential life lost from 0 to 70 years, as is revealed by the figures for 1989 shown in Table 1.

TABLE 1
Years of potential life lost (YPLL) between 0 and 70 years of age from the nine leading causes of death, and total deaths, all causes, both sexes, Venezuela, 1989.

| Causes of death | YPLL ^a | Percentage ^b |
|--|-------------------|-------------------------|
| Certain conditions originating in the perinatal period (760-779) | 440,017.0 | 21.6 |
| Accidents (all types) (E800-E949) | 278,862.5 | 13.7 |
| Intestinal infectious diseases (001-009) | 171,934.0 | 8.4 |
| Malignant neoplasms (all types) (140-208, 230-234) | 130,255.5 | 6.4 |
| Heart disease (393-396, 402, 404, 410-429) | 125,877.0 | 6.2 |
| Suicide and homicide (E950-E969) | 123,789.5 | 6.1 |
| Pneumonia (480-486) | 99,676.0 | 4.9 |
| Cerebrovascular disease (430-438) | 40,808.0 | 2.0 |
| Diabetes mellitus (250) | 22,219.0 | 1.1 |
| Total deaths, nine groups of causes | 1,433,438.5 | 70.3 |
| Total deaths, all causes | 2,038,651.5 | 100.0 |

^aIn thousands.

^bPercentage of the total.

TABLE 2
Crude death rates per 100,000 population by major groups of causes, according to living conditions, Venezuela, 1989.

| Groups of causes | Strata according to percentage of the population with unmet basic needs (UBN) | | | | | Country total |
|---------------------------------------|---|--------|--------|--------|---------|---------------|
| | 0–19% | 20–39% | 40–59% | 60–79% | 80–100% | |
| Communicable diseases ^a | 32.7 | 47.3 | 56.8 | 88.2 | 92.8 | 55.9 |
| Malignant neoplasms ^b | 76.2 | 60.7 | 57.7 | 58.6 | 63.3 | 61.1 |
| Cardiovascular diseases ^c | 150.3 | 127.1 | 127.2 | 144.7 | 156.0 | 132.8 |
| Perinatal conditions ^d | 17.5 | 34.9 | 43.6 | 49.2 | 52.0 | 38.5 |
| Other causes ^e | 97.5 | 96.8 | 100.0 | 110.5 | 111.3 | 100.2 |
| External causes ^f | 55.8 | 51.6 | 44.8 | 45.0 | 42.1 | 48.6 |
| Percentage “undiagnosed” ^g | 2.6 | 8.0 | 18.4 | 29.0 | 32.6 | 14.9 |

^aICD-9, 001–139, 320–322, 460–466, and 480–487.

^bICD-9, 140–239.

^cICD-9, 390–459.

^dICD-9, 760–779.

^eAll other diseases, from 001–799.

^fICD-9, E800–E999.

^gUp to 1989, all deaths attributed to signs, symptoms, and ill-defined conditions; deaths for which the death certificate was not signed by a physician; and deaths for which “Part B” of the death certificate was filled out by a physician other than the attending physician were classified as “undiagnosed.”

Mortality rates for six major groups of causes and by age group, were calculated for 1989 for five strata of parishes classified according to living conditions. Table 2 shows the figures for major groups of causes. The percentage of undiagnosed deaths rose from 2.6% for the stratum with between 0% and 19% UBN to 32.6% for the stratum with between 80% and 100% UBN. (Up to 1989, a death was classified as “undiagnosed” in Venezuela if it was certified by a physician other than the attending physician, if no medical death certificate was issued, or if the death was attributed to signs, symptoms, and ill-defined conditions.) The rates of death from communicable diseases and for certain conditions originating in the perinatal period in the fifth stratum are almost triple those in the first. In the first stratum (those persons with the best living conditions), these two groups of causes combined were responsible for only one-third as many deaths as cardiovascular diseases (50.2 and 150.3 per 100,000 population, respectively), but in the fifth stratum (those persons with the worst living conditions) the figures are almost the same (144.8 per 100,000 for communicable diseases and perinatal conditions together and 156.0 per 100,000 for cardiovascular diseases). The rates in the latter stratum are lower only for the group of external causes and neoplasms. For the other cause groups, the rates are higher and then decline slightly in the intermediate strata. The rates for cardiovascular diseases vary by only –4.3 to +17.5 per 100,000 in relation to the national average. The highest rates occur in the stratum with the worst living conditions.

Table 3 shows age-specific mortality rates according to living conditions. The rates for the group 65 and older remain constant, whereas for the other groups they increase by between 21.5% for the group aged 45–64 and 290.4% for the group aged 1–4. The relatively lesser increase in the rates for the under-1 age group is again due to possible higher underregistration in the strata with the worst living conditions. Underregistration of deaths in the under-1 age group has been estimated at close to 25% of the total. Considering this underregistration of deaths, coupled with the fact that underregistration of the population aged under 1 may be close to 10%, the age-specific mortality rate for this age group for the country as a whole would be approximately 27.4 per 1,000 population—closer to the 1989 estimate of infant mortality in Venezuela, which was 35 per 1,000. Nevertheless, it is important to point out that the age-specific mortality rate for the under-1 age group does not correspond exactly to the infant mortality rate because different denominators are used for the two figures.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Perinatal, Child, and Adolescent Health

The country's infant mortality rate has decreased markedly over the past 30 years, but the decline

TABLE 3
Age-specific mortality rates per 1,000 population according to living conditions,
Venezuela.

| Age groups | Strata according to percentage of the population with unmet basic needs (UBN) | | | | | Country total |
|-------------|---|--------|--------|--------|---------|---------------|
| | 0-19% | 20-39% | 40-59% | 60-79% | 80-100% | |
| Under 1 | 15.7 | 22.7 | 21.7 | 29.4 | 29.2 | 23.1 |
| 1-4 | 0.52 | 0.87 | 1.09 | 1.99 | 2.03 | 1.14 |
| 5-14 | 0.31 | 0.37 | 0.42 | 0.49 | 0.55 | 0.41 |
| 15-44 | 1.43 | 1.53 | 1.73 | 2.08 | 2.28 | 1.67 |
| 45-64 | 6.68 | 8.91 | 8.94 | 8.76 | 8.12 | 8.57 |
| 65 and over | 50.2 | 52.9 | 49.9 | 48.2 | 49.6 | 50.8 |
| All ages | 4.30 | 4.18 | 4.30 | 4.96 | 5.17 | 4.37 |

slowed after 1988. The rates recorded for the years from 1987 to 1991 were 25.0, 23.4, 24.7, 24.9, and 24.8 per 1,000 live births, respectively.

No data are available on well-child care coverage.

The data from a social survey carried out in 1991, reveal that 12.1% of children under 1 were exclusively breast-fed, 57.7% were breast- and bottle-fed, and 29.8% were exclusively bottle-fed (0.4% of the mothers surveyed did not indicate the feeding method).

No data are available on the prevalence of low birthweight at the national level, but at the Concepción Palacios Maternity Hospital, which is the largest in the country and serves as the national referral center for the highest-risk cases, the percentage of children born weighing under 2,500 grams rose from 12% to 13% between 1986 and 1989, and to 16% in 1990. Recent studies of all births registered in the city of Barquisimeto in 1991 and 1992 show that the percentage of infants with low birthweight in the 45 neighborhoods with the worst living conditions in the city is as much as double (16%) that of neighborhoods where conditions are better, while the percentage of infants with very low birthweight (under 1,500 grams) is three times higher (1.2% as compared to 0.4%).

According to figures from the Ministry of Health and Social Welfare, 94% of births occur in health institutions, but it is estimated that the true figure is closer to 90%. The leading cause of death among children under 1 year of age in 1990 was the group comprising hypoxia, birth asphyxia, and other respiratory conditions (ICD-9, 768-770), which accounted for 29.7% of all deaths, many of them of newborns. Obstetric and maternal complications affecting the fetus or newborn (ICD-9, 760, 761-763, 772, and 773) were responsible for 4.2% of the deaths in the under-1 age group.

The second leading cause of death in this group (11.5% of the total) was infectious intestinal diseases. According to data from the 1991 social survey, in the week prior to the interview, close to 13% of the chil-

dren under 2 had experienced at least one episode of diarrhea, and in 5% of those children, the episode had lasted for 4 or more days.

Immunization coverage among children under 1 increased between 1988 and 1992: from 71% to 74% for the oral polio vaccine, from 58% to 68% for the DPT vaccine, from 53% to 65% for the measles vaccine, and from 50% to 87% for BCG. Coverage levels vary considerably from region to region within the country. In 1992, four states, including the most-populated state (the Federal District), continued to have measles vaccination coverage of under 50%.

There were 51 reported cases of neonatal tetanus in 1988, 37 in 1989, and 37 in 1991. In 1992, a plan for the elimination of this disease was established for the country, based on epidemiologic data and the identification of high-risk parishes. Studies have revealed that the risk of neonatal tetanus is 12 times higher in rural populations; 93.5% of the cases have occurred in home births, 37% of which were attended by traditional birth attendants and 63% by a family member. Among the mothers of newborns who contracted the disease, 90% had not been vaccinated and 60% had little or no formal education (illiterate or under 1 year of schooling). The highest incidence occurred in parishes where 80% or more of the population has unmet basic needs. The population of these 143 parishes totaled approximately 796,000 in 1989—4.1% of the country's total population. It should be noted that the risk in a given population is determined not on the basis of whether cases have occurred in the parishes, but rather on the basis of the living conditions in those parishes.

In the group aged 1-4, the leading cause of death is accidents (which accounted for 23.4% of all deaths from defined causes in 1988), followed closely by acute respiratory infections and diarrheal diseases. In the group aged 5-14, accidents by far outdistance any other cause of death (accounting for 41.5% of all deaths from defined causes in 1988). Deaths from external

causes made up 65.9% of all deaths from defined causes in the group aged 15–24 in 1988 (76.5% for males). A growing problem among adolescents, especially those in large urban areas, is the use of illicit drugs.

According to data from the food and nutrition monitoring system of the National Nutrition Institute, for the group of children under 10 who had been weighed and measured at the time they visited a Ministry of Health and Social Welfare establishment in 1990 (approximately 300,000), the proportion showing low weight-for-age was 25% (1.1% severe). The figure for low height-for-age was 30.7% (3% severe) and that for low weight-for-height was 18% (0.9% severe). The proportion of overweight as measured by the indicator weight-for-height was 7.6%.

Health of Adults

For the country as a whole, the leading cause of death among the population aged 25–64 was cardiovascular diseases (which accounted for 28.1% of all deaths from defined causes in 1989: 27.3% among males and 29.7% among females), followed by malignant neoplasms (18.9% of all deaths from defined causes; 13.5% among males and 28.6% among females) and accidents (13.7% of all deaths from defined causes; 18.3% among males and 5.9% among females). Only provisional data are available for subsequent years, but the figures are estimated to be similar. Specific mortality from cardiovascular diseases for all age groups is 132.8 per 100,000 population, but the true importance of this group of causes is apparent especially in the population aged 45 and older.

Age-specific mortality rates for the age groups 45–64 and 65 and older, analyzed according to population strata with differing unmet basic needs, show that for cardiovascular diseases, the rate is approximately 37% higher among the groups with the worst living conditions, as compared to the groups with the best living conditions. For malignant neoplasms, on the other hand, the rates are virtually the same for all strata, regardless of living conditions. Communicable diseases continue to be a significant cause of death for the strata living in the worst conditions, with their incidence doubling in the group aged 45–64, although this cause accounts for a relatively small proportion of the deaths in this age group (6.0% of all deaths from defined causes). Specific mortality from communicable diseases is close to eight times lower than mortality from cardiovascular diseases in the group with the best liv-

ing conditions, but it is only four times lower in the group with the worst living conditions. Accidents and violence have much less relative importance in the group aged 45 and older as compared to younger age groups, accounting for 7.5% of all deaths from defined causes in this group. Nevertheless, the specific rate for this group of causes remains high—64 per 100,000.

With the exception of data on cancer, which are included in the section on malignant neoplasms, data on morbidity among adults are scarce.

Health of Women

The program for prevention of cervical cancer administered by the Ministry of Health and Social Welfare reaches under 20% of women aged 15–49, and there are indications that the same population group continues to be covered by the program year after year. Nevertheless, mortality from cervical cancer has declined from almost 17 per 100,000 women of all ages in 1960 to 8.2 in 1990. At the national level, the ratio of detection of invasive carcinoma of the uterine cervix versus carcinoma in situ is approximately 3:2, which indicates late diagnosis.

The specific mortality rate for breast cancer increased by about 20% between 1960 and 1990.

The results of the 1991 social survey revealed that only 22.5% of women in the ninth month of pregnancy had received four or more prenatal check-ups (1.7% of those surveyed did not indicate how much prenatal care they had). Of these same women, 32.3% had received services in the private sector.

Mothers aged under 20 accounted for 17.7% of all registered births in 1988, and mothers 15 or younger accounted for 10.9%.

Maternal mortality has remained at close to 0.6 per 1,000 live births for several years.

In 1991, the family planning program of the Ministry of Health and Social Welfare had a coverage level of 14.5% of all women of childbearing age. Data on the number of abortions performed in the country are not available because the procedure is illegal.

Health of the Elderly

Age-specific mortality from cardiovascular diseases for the age group 65 years old and over is 2,530 per 100,000, and it rises by 6% as living conditions worsen, from 2,453 in the group of parishes in which less than 20% of the population has unmet basic needs to 2,614

where 80% or more of the population has unmet basic needs. Communicable diseases account for a small proportion of all deaths (7.6%), except among the groups living in the worst conditions, in which they cause almost the same percentage of deaths as malignant neoplasms and the death rate from this cause is close to 27% higher than for groups living in better conditions. External causes are responsible for a relatively small proportion of deaths in this age group (2.8% of all deaths from defined causes), but the specific rate continues to be high (142 per 100,000 persons aged 65 or older).

Workers' Health

Affiliation with the Venezuelan Social Security Institute (IVSS) is low—about 13% of the country's population—and varies considerably from region to region. For example, it is high in the state of Bolívar (mining and heavy industry), but is practically nil in the state of Mérida (agriculture and services). At the national level, IVSS provides health care coverage to approximately 37% of the population.

Data currently available on workers' health are very limited. The total number of work-related accidents recorded by the Ministry of Health and Social Welfare's Division of Safety and Prevention of Accidents and Violent Acts was only 22,800 for the 1985–1989 period. According to estimates by specialists in the area, approximately 100,000 work-related accidents occur every year, killing more than 1,500 workers and leaving 10,000 disabled.

Health of Indigenous Peoples

Little information is available on morbidity and mortality among indigenous groups, but some specific problems are known. Of all the cholera cases in the country, 35% have been among indigenous populations, mainly Guajiros and Waraos, and the incidence has been 30.4 times higher among indigenous groups than among the rest of the population.

Data collected in Venezuela as part of a study carried out in 1992 on health of indigenous peoples in the Americas present an overview of the problem. Living conditions are poor for almost all indigenous groups, which leads to high rates of morbidity from diarrheal diseases, intestinal parasitoses, acute respiratory infections during childhood, and other diseases. Infant mortality among these groups is high. A study con-

ducted in the state of Amazonas showed that among the Bari Indians (who live along the southern border with Brazil and Colombia), 22% of the population is seropositive for hepatitis B and 70% of the adults have some form of tuberculosis; the same situation afflicts the Yanomanis. There have been reports of nonvenereal treponematoses (yaws and pinta) among members of the Yapuro in the state of Apure. According to the 1982 census, 74% of the indigenous population had no access to any type of care and only 13% had access to a physician (often one of a team of physicians that visits the tribe only once or twice a year).

Diseases and Health Impairments

Communicable Diseases

Despite the growing importance of chronic noncommunicable diseases, communicable diseases remain significant causes of death in Venezuela, especially among population groups with poor living conditions. Acute respiratory infections, particularly pneumonia, are among the 10 leading causes of death for all age groups, and Chagas' disease is among the 10 leading causes in the population aged 45 and over.

The most significant communicable diseases in terms of geographic reach and number of people affected are malaria, dengue fever and dengue hemorrhagic fever, Chagas' disease, leishmaniasis, schistosomiasis, leprosy, and onchocerciasis, although only Chagas' disease and dengue are significant causes of death.

The incidence of malaria in the country began to climb rapidly in 1982, when 4,269 cases were reported, and by 1988 it had soared to 43,000 cases per year; in 1992, however, the number of cases dropped to 21,524. More than half the cases reported in recent years occurred in the state of Bolívar; other foci, in order of importance, are the states of Sucre, Amazonas, Apure, and Táchira. The decrease in cases since 1992 has been due mainly to the successes achieved in the state of Bolívar under an agreement among the Ministry of Health and Social Welfare, the state government, and the major mining and industrial company (state-run), through which greater resources have been made available for control activities. The decline also is linked to fewer mining concessions, mine closings, migration of the mining population to other parts of the country, and the introduction of mechanized mine exploration. The breakdown of parasite forms observed in 1992 was 76% *Plasmodium vivax* and 24% *P. falciparum*.

parum. In 1991 the proportions were 81.8% and 18.2%, respectively.

The outbreak of dengue fever that began in 1989 is associated with a decrease in activities to control the vector *Aedes aegypti*, which is present virtually everywhere in the country, because resources were diverted to malaria control in response to the explosive spread of the latter disease.

Since 1950, several epidemic outbreaks of dengue fever have been registered, the most severe ones occurring in 1964 (about 18,000 cases), 1966 (8,000), and 1978 (1,200). The most important recent outbreak (1989–1990), during which 12,000 cases were reported, affected 70% of the country. With this outbreak, the first cases ever of dengue hemorrhagic fever were observed in Venezuela; more than 2,600 cases of dengue hemorrhagic fever were reported between 1989 and 1992. Dengue has remained highly endemic, and cases (6,500 in 1991 and more than 2,000 in 1992) and recurrent outbreaks continue to occur in several parts of the country. As of late 1992, almost 200 deaths from dengue had been registered since the onset of the 1989–1990 epidemic.

No human cases of yellow fever have been reported since 1978, although an epizootic did occur during 1991 and the early months of 1992. The absence of cases is the result of vaccination programs that target populations living near epizootic foci, and health education campaigns that promote voluntary immunization in risk areas.

Chagas' disease vectors are found in 86.5% of the country's parishes, which comprise 78% of its total area. In 168 parishes (11% of the total area), the sole vector is *Rhodnius prolixus*; in 55 (7% of the total area), *Triatoma maculata* is the sole vector; and in 422 (60% of the total area), both vectors exist. The populations living in these areas represent more than 80% of the total population of the country. The household infestation rate decreased over the past three decades, from 8.3% in 1964 to 0.7% in 1992, and the infection rate declined from 0.33% to 0.01% during the same period. Nevertheless, according to estimates of the Chagas' control program, there are still more than 800,000 infected persons in the country.

The endemic area for intestinal schistosomiasis (bilharziasis) matches the region where the vector *Schistosoma mansoni* is found, and it encompasses the states of the central northern coastal region. This covers approximately 15,000 km² and is the most densely populated in the country. The prevalence, which was 14% during the 1943–1960 period, had fallen to 0.7% in 1986–1990. In a 1989 study in the state of Carabobo,

2,062 samples were examined using serological techniques and 38% were found to be positive; another study conducted in 1990 found 26% of 1,350 samples to be positive.

In 1991, Venezuela had 8,947 cases of leprosy registered for treatment; 71.6% were multibacillary and 28.4% were paucibacillary. Between 400 and 500 new cases were reported each year during the 1985–1991 period (464 in 1991). The prevalence rate is 4.52 per 10,000 population. The states of Apure, Táchira, Mérida, Trujillo, and Barinas have been the hardest hit, with prevalence rates of over 20 per 10,000. In Nueva Esparta and the Federal District the rate is between 10 and 20 per 10,000. It is estimated that in the past 40 years the incidence of leprosy in the country has decreased from 16 per 100,000 (in 1951) to 2.3 (in 1991).

The first case of cholera was reported on 3 December 1991, and by the end of that year a total of 15 cases had been recorded; in Venezuela, a cholera case must be confirmed by laboratory diagnosis. During 1992, the disease spread virtually throughout the country, affecting 18 of the 23 federative entities. The state of Zulia—particularly the area inhabited by the Guajiros Indians, where the epidemic began—continues to have the most cases (852 in 1992). Two major outbreaks have occurred, one in the state of Delta Amacuro among the Warao Indians (552 cases in 1992), which spread to the neighboring state of Sucre (847 cases in 1992). As of epidemiologic week 53, which ended on 2 January 1993, 2,852 cases had been confirmed by laboratory diagnosis and there had been 1,226 hospitalizations (hospitalization rate of 43.1%) and 68 deaths (case-fatality rate of 2.3%).

Diarrheal diseases are a leading cause of morbidity. The Ministry of Health and Social Welfare's reporting system recorded 275,000 cases in 1988, 292,000 in 1989, 393,000 in 1990, 494,000 in 1991, and 453,000 in 1992; the increase in reporting may have been related to health education activities carried out in response to the cholera epidemic. Mortality from diarrheal diseases, by contrast, declined from 2,538 in 1990 to 1,674 in 1991 and 1,210 in 1992. This significant reduction in mortality also may have been a result of cholera prevention and control activities.

Regarding rabies and other zoonoses, in 1992 there were 86 cases of canine rabies, 3 cases of feline rabies, and 1 case of human rabies transmitted by a vampire bat. Of the 86 canine cases, 66 (77%) occurred in the state of Zulia. A total of 1,794 cases of canine rabies were reported in the 1982–1986 period, while 392 cases were reported in 1987–1991. During these same periods, the numbers of human rabies cases reported were

35 and 8, respectively. The number of human cases of canine origin remained virtually constant during the 1987–1991 period, with 3, 1, 1, 1, and 2 cases, respectively, reported in each year of that period.

During the first week of December 1992 an outbreak of Venezuelan equine encephalitis (VEE) was detected in the state of Trujillo. The disease affected both the equine and human populations, and the VEE virus was isolated from both animals and humans.

Reported cases of AIDS in Venezuela totaled 2,534 as of 31 March 1993. Cases increased substantially between 1987 and 1989, with 72 cases reported in 1986, 150 in 1987, 311 in 1988, and 388 in 1989. Since then, the number of cases has changed less dramatically: 511 cases in 1990, 531 in 1991, and 420 in 1992. Because many doctors report AIDS cases only after the death of a patient, the true figures for 1991 and, especially, for 1992 are surely higher.

The greatest number of cases occurred in the group aged 20–49 (85.3% of the total). The risk factors are known for 1,757 cases (69.3% of the total). Of these, 1,234 (70%) of the patients were homosexual or bisexual individuals, 44 (2.5%) were hemophiliacs, 38 (2.2%) were intravenous drug addicts, and 61 (3%) were persons with several risk factors. A rise in the number of women affected has been noted since 1990 (173), and 21 cases of perinatal transmission have been reported, all of them between 1990 and 1993. Since 1987, all blood banks in the country are required to screen for HIV. As of October 1992, 29 cases transmitted through blood transfusion had been reported, with 13 deaths. AIDS deaths as of 31 March 1993 totaled 1,347 (53.2% of the reported cases). Both cases and deaths are underreported.

Severe underreporting problems also exist with regard to other sexually transmitted diseases (STDs). Although the venereal disease services of the Ministry of Health and Social Welfare have registered a decline in the incidence of several diseases, including syphilis and especially gonorrhea, the country's blood banks continue to report rises in the number of donors rejected because they test positive for syphilis. The total number of STD cases recorded by the venereal disease services tended to steadily decline between 1986 and 1991 (79,000, 75,000, 64,000, 53,000, 59,000, and 49,000, respectively). Reported gonorrhea cases decreased from 26,000 in 1986 to under 16,000 in 1991. Several studies have shown that the circulation of penicillinase-producing strains of *Neisseria gonorrhoeae* is on the rise in Venezuela. The national reference service has observed growing percentages of these strains, with the figure reaching 37% in 1991.

In 1991, 5,216 cases of tuberculosis were reported, 86% of which were the pulmonary form. The prevalence of all forms of tuberculosis was 27 per 100,000 population. Most treatments are fully supervised. BCG vaccination coverage in 1992 was 84.3% among children under 1, but reached only 5.1% among children entering school.

Some form of tuberculosis was the underlying cause of 0.9% of all deaths registered in the country in 1989. Mortality from the disease is almost 20 times higher in the population stratum with the worst living conditions, as compared to the stratum with the best living conditions (8.6 and 0.5 per 100,000, respectively, in 1989).

The last case of poliomyelitis was reported in March 1989.

Measles is endemic in Venezuela. Historically, rates have tended to decline, with epidemics occurring every 5 years. An epidemic in 1991 produced 13,879 reported cases (40.5% more than in 1990). There were 11,087 cases in 1992. The case-fatality rate is low (under 0.1%).

More than 16,000 cases of hepatitis were reported by Ministry of Health and Social Welfare establishments in 1992; in 1991, more than 18,000 cases were reported. The viral agent is unknown in most cases. Some isolated studies have detected 20%–40% hepatitis B among all the cases reported. The problem is particularly severe in some indigenous communities; several Yanomani villages, for example, have shown HBV seropositivity levels of up to 80%.

Between 1989 and 1992, an annual average of 1,700 cases of leishmaniasis were detected, with predominance of the localized cutaneous forms. Cases have been reported in all but two of the federative entities. Visceral leishmaniasis (Kala-azar) occurs in the states of Guárico, Sucre, and Lara, which report some 50 cases a year. However, there is considerable underreporting, and it is possible that for every reported case there are as many as 10 unreported ones.

There are three foci of onchocerciasis—one in the northeastern region of the country, another in the central region, and a third in the south. The number of existing cases is estimated at 80,000.

Since 1989, cases of a disease with hemorrhagic manifestations have been detected in the *municipio* of Guanarito in the state of Portuguesa; the disease was initially assumed to be hemorrhagic dengue. However, in 1990 a new viral agent belonging to the Arenaviridae family was isolated from serum samples taken from patients who had died. This virus was given the name "Guanarito." Clinically and epidemio-

logically, the new disease—which has been named Venezuelan hemorrhagic fever—resembles Argentine and Bolivian hemorrhagic fever and Lassa fever, which occurs in western Africa. The virus also has been isolated in two different species of rodents in the region. As of December 1991, 87 cases and 31 deaths had been registered (case fatality of 35.6%).

Cardiovascular Disease

The only records available on cardiovascular disease are kept by the Ministry of Health and Social Welfare, and they are incomplete; during the 1985–1989 period, the Ministry's Cardiovascular Disease Department recorded 49,415 cases, but during that same period, 81,161 persons died of cardiovascular causes. Hypertensive disease accounted for 43.7% of all the cases reported, followed by ischemic heart disease without hypertension (14.3%), ischemic heart disease with hypertension (12.3%), and congenital anomalies of the heart (8.1%). Of all cases, 57.2% occurred in women, and of those cases 49.2% were cases of hypertensive disease. The records for the 5-year period show only 3,103 recorded cases of diseases of the arteries, arterioles, and capillaries (ICD-9, 440–448) and 193 cases of diseases of the veins and other diseases of the circulatory system (451–459).

Malignant Neoplasms

Cancer has continued to rank as the second leading cause of death during the past decade. Data for 1989 show that crude death rates from this cause were 51.33 per 1,000 for females and 48.12 per 1,000 for males. The three most frequent sites among males are the stomach, the bronchi and lungs, and the prostate, with crude death rates of 8.34, 8.22, and 6.15 per 100,000, respectively. Among females the three most frequent sites are the uterine cervix, the breast, and the stomach, with crude death rates of 9.76, 5.99, and 5.59 per 100,000, respectively. Cancer of the bronchi and lungs ranks in fourth place among women, with a crude death rate of 4.73 per 100,000. In 1990 mortality from cancer of the stomach fell to half of the 1960 rate among males and to one-third among females. Mortality from cancer of the bronchi and lungs, however, almost doubled for both sexes during the same period.

The oncology division of the Ministry of Health and Social Welfare keeps a countrywide registry of cases.

In 1989, the crude incidence rates for all types of cancer were 87.4 per 100,000 for females and 72.06 per 100,000 for males. The most frequent sites in that year among males were prostate, stomach, and bronchus and lung, with crude incidence rates of 12.91, 10.01, and 9.04 per 100,000, respectively. Among females, the most frequent sites are the same as those indicated previously in regard to death rates: uterine cervix, breast, and stomach, with crude incidence rates of 23.43, 13.77, and 6.71 per 100,000, respectively.

Oral Health

Epidemiologic studies have found an average DMF (decayed, missing, and filled teeth) index of 3.94 permanent teeth for the population aged 7–14 and of 7.41 for those aged 14. It has also been found that 45% of children aged 7–14 show some sign of periodontal disease. In the group aged 35–44, only 16% have been found to be free of periodontal disease and in the group aged 55–64 the figure is scarcely 6%.

A 1987 study of 12-year-olds showed significant differences in the DMF index of urban and rural populations: figures of 3.73 and 4.01 in the central-western region, and 3.80 and 5.59 in the northeastern region were found for urban and rural areas, respectively. Among the indigenous population, the rates ranged from 4.45 in the state of Zulia to 5.56 in Delta Amacuro and 7.75 in Amazonas.

Risk Factors

Natural Disasters and Industrial Accidents

No major natural disasters or industrial accidents have occurred in recent years, but the potential for such incidents exists. Venezuela has many areas of seismic activity, and oil and petrochemicals constitute the largest industry in the country.

Housing and Urbanization

The 1990 census classified 12.6% of the housing units in the country as "shacks"; in 1950, according to the Central Office of Statistics and Data Processing, 46.7% fell into that category. The percentage decrease may be attributed to efforts undertaken to improve this type of dwelling in stages through structural renovations and the provision of services. As a result, more dwellings

can now be classified as houses, rather than shacks, although they do not always meet the standards for adequate housing. Of all the housing units in the country, 88.7% have piped water (not always treated); only 6.4% lack facilities for excreta disposal (8.7% are pit latrines or privies), and 96.1% have electricity. The most serious housing problems are found in rural areas and urban slums. Solid waste disposal is a problem, but available figures are not adequate to quantify the situation.

In the country's central area, which is the most densely populated, virtually all water resources have been used up, and large-scale works will be needed to transport water from remote areas. Water supply systems in the major cities are in serious disrepair, and leaks lose up to 30% in the Caracas metropolitan area.

Other Risk Factors

Other risk factors (drug abuse, smoking, excessive alcohol consumption, diet, lack of exercise, etc.) have been insufficiently studied. The few existing studies are quite limited in scope and their findings cannot be extrapolated to the entire country.

SOCIAL RESPONSE TO HEALTH PROBLEMS

Policies

The 1987 Organic Law on the National Health System endorsed and broadened the concept of regional authority, created a national system with autonomy in the Federal District and the states, and established the Ministry of Health and Social Welfare as the lead agency in the sector. A 10-year deadline was set for the system's full implementation. In 1989, with the enactment of the organic law on municipal authority and the organic law on decentralization and transfer of public power, a decentralization process also was set in motion.

In 1993, the Ministry published a policy document that reviews the country's health policy history, briefly describes the national health system, analyzes the health situation, and establishes a plan of action.

The basic thrusts of Venezuela's health policy are the consolidation of the public sector institutions into a single entity, administrative decentralization, reorga-

nization of the health sector, development of primary health care, and emphasis on health promotion and disease prevention.

It has been determined that the central level should retain the following functions in the decentralized system:

- Formulation and oversight of national health policy;
- Border health policy (including policies relating to seaports and airports);
- National epidemiologic information;
- International relations in the area of health;
- Health research policies;
- Evaluation and registration of technology;
- Relations between sectors and geopolitical units;
- Establishment of standards relating to institutional information, procedures, physical plant, and equipment;
- Evaluation, oversight, monitoring, and advisory services;
- Policies and approaches in human resources training; and
- Cooperation and coordination of relief efforts in disaster and emergency situations.

Organization of Services

The five main health sector institutions are the Ministry of Health and Social Welfare, the Venezuelan Social Security Institute (IVSS), the government of the Federal District, the Social Welfare Institute of the Ministry of Education, and the health services of the armed forces, all of which are in the public subsector. There also are more than 70 other institutions in the public and private (for-profit and nonprofit) subsectors.

The Ministry of Health and Social Welfare has organized the country into 23 health regions, each of which is subdivided into health districts. The regions generally correspond to the states, with the exception of the capital region, which encompasses the Federal District and part of the neighboring state of Miranda in the Caracas metropolitan area. Most of the health districts are made up of one or more *municipios*, although some densely populated urban *municipios* are divided into several districts; other health districts include parts of several *municipios*. The trend is to decentralize to the *municipio* level. Each health region is managed by a regional director of the national health system, and the districts are headed by a chief.

All the functions of the health district chiefs have not been entirely defined, although their responsibility for

the Ministry's outpatient network in their respective districts has been established. The Division of Malariology and Environmental Sanitation of the Ministry organizes the country into areas, each headed by a chief, but these divisions do not necessarily correspond to the health districts. The regional directors report to the General Health Division of the Ministry. As part of the decentralization process, the governors of several of the states in which the most headway has been made have designated "governor's health commissioners." In some places parallel systems such as epidemiologic surveillance and outpatient care are being established.

Each of the other public sector institutions has its own structure. The government of the Federal District has exclusive jurisdiction in that District, where it operates several hospitals (among them some of the largest in the country) and its own outpatient care network.

The IVSS has its own hospitals and contracts for beds in other institutions; it also operates an outpatient care network, with extremely variable coverage in the various states of the country.

The National Institute of Occupational Health and Safety, created in 1991, is responsible for enforcing the organic labor law and occupational health and safety regulations, among other functions. Programs to educate and train personnel to work in the area of workers' health have been launched or expanded.

In late 1992, a malaria research group was created under the coordination of the School of Malariology and Environmental Sanitation; the participants in the group were the Central University of Venezuela, the University of Carabobo, the University of the Andes, the Venezuelan Institute for Scientific Research, the Amazon Center for Scientific and Technological Research, the Oriente University, and the Ministry of Health and Social Welfare. The group aims to promote interinstitutional cooperation between the scientific community and the Ministry's Malariology Division for the execution of research projects to support the malaria control program. In 1984, a schistosomiasis research group was created for similar purposes, with the participation of the Central University, the University of Carabobo, the Venezuelan Institute for Scientific Research, and the Ministry.

An integrated project for the control of endemic diseases, funded by multilateral international agencies, has been under way since 1993. The diseases included under the project are malaria, Chagas' disease, schistosomiasis, leprosy, leishmaniasis, onchocerciasis, dengue, cholera, yellow fever, tuberculosis, and intestinal

parasitoses. The project focuses on primary care level services, emphasizing community participation.

Personal Health Care Services

The number of services provided by the Ministry, in absolute terms, has decreased steadily over the last few years, possibly reflecting the economic crisis. Between 1987 and 1991 medical care visits decreased from 21.83 million to 17.22 million; preventive care visits, from 8.63 million to 8.39 million; dentist visits, from 5.68 million to 2.94 million; health inspection visits, from 751,000 to 268,000; social service visits, from 3.06 million to 1.19 million; and hospitalizations, from 1.02 million to 946,000. No data are available regarding the activities of other institutions in the public and private sectors.

The occupancy rate in Ministry hospitals was 69.7% in 1991, with an average length of stay of 5.6 days and a bed turnover rate of 45.7.

Coverage by the public sector has decreased in recent years. During the mid-1980s it was estimated to be around 90%. However, the 1991 social survey found that, in response to a question on what type of service was utilized by the population over 10 years old in the event of acute illness or injury, 34.0% of the respondents said they had sought treatment at a private clinic, 54.4% had gone to a public hospital or outpatient clinic, and the remainder had received treatment from other types of services, such as medical services in the work place or pharmacies. Of all the respondents aged 10 and older who had experienced injuries or acute illness, 33.6% had not sought any treatment. Among the reasons cited by that group for not seeking treatment were "lack of money" (17.7%) and "dislike of public services" (5.6%).

An important development in recent years has been the increase in community participation. In 1991, the Ministry's Division for Social Promotion of Health supported the development of 5,078 grass-roots organizations. One of the important aspects of the process of strengthening and developing the health districts has been the incorporation of organized community groups in the execution, management, and evaluation of health activities.

The entity charged with ensuring comprehensive care for the elderly is the National Institute of Geriatrics and Gerontology. The Institute's coverage up to now has remained quite low; although the exact figure is unknown, by way of comparison, the number of medical visits to establishments of the Institute in 1992

was under 51,000 (57.4% were to geriatrics units), whereas medical visits of all types to establishments of the Ministry of Health and Social Welfare in 1990 totaled more than 35 million.

Available Resources

The Ministry has the largest network of resources. In late 1992, it operated 3,797 outpatient units, 610 of them in urban areas. Of the remaining 3,187 units in rural areas, 789 are type II, or staffed by a physician, and 2,498 are type I, or staffed only by auxiliary personnel. The country had 609 hospitals—298 in the public sector (190 operated by the Ministry) and 311 in the private sector—and a total of 52,681 beds (approximately 2.61 beds per 1,000 population)—41,874 in the public sector (26,867 in Ministry institutions) and 10,807 in the private sector.

The number of physicians increased from 28,400 in 1987 to 32,616 in 1992 (from 1.55 to 1.65 per 1,000 population). In 1992, there were 15,026 graduate nurses, 40,234 nursing auxiliaries, 7,945 dentists (0.4 per 1,000 population), and 5,661 pharmacists.

In 1992, the country had 1,820 clinical laboratories in the private sector and 557 in the public sector, and there were 141 blood banks. In 1992, a total of 393,438 transfusions were performed. Almost all blood is screened for syphilis, hepatitis, AIDS, and Chagas' disease.

The geographic distribution of health resources is extremely uneven. The average number of beds ranges from close to 1 per 1,000 population in some states (such as Barinas, Apure, and Portuguesa) to close to 4 per 1,000 (Zulia) and more than 6 (Federal District). The distribution of physical and human resources shows a similar pattern. The areas with the fewest resources in relative terms are those in which the need is greatest owing to poor living conditions. In the states of Apure, Barinas, and Portuguesa, more than 60% of the population has unmet basic needs. In the Federal District, the proportion of the population with unmet basic needs is approximately 28%, and in the state of Zulia the figure is 48%.

An estimated 70%–80% of all health funding comes from the public sector. According to consolidated data of the Central Bank of Venezuela, public spending on health in 1990 was close to US\$ 50.00 per capita, a 55% reduction from the figure of US\$ 112.00 in 1983 (in constant 1991 U.S. dollars). The Ministry of Health and Social Welfare's share in health spending declined from 47% in 1983 to 41% in 1990, while that of

the IVSS rose from 31% to 49% during the same period. The Ministry was allotted 7.93% of the national budget in 1993. With the decentralization process, a substantial portion of health resources is being channeled to the state governments.

Health infrastructure has grown in absolute terms, although there has been a decline in some per capita indicators, such as the number of hospital beds, which decreased from 2.74 per 1,000 population in 1985 to 2.61 in 1992. Human resources have increased in both absolute and per capita terms, especially in administration and maintenance. The staff of the Ministry increased from 76,000 to 100,000 between 1982 and 1991.

There is a widespread perception in the country that the public sector hospitals are in crisis, owing in large part to low levels of quality and efficiency. Many public hospitals are overstaffed (close to five staff members per bed, compared with world averages of between two and four). Overstaffing is especially evident among administrative personnel and unskilled workers, whereas there is a shortage of skilled workers such as nurses and mid-level managers. There are serious problems such as deficient equipment maintenance and the deterioration of physical plants; the national government and various state governments are currently studying several possibilities for remedying this situation, including the transfer of responsibility for Ministry and IVSS hospitals to the state governments or to nonprofit foundations, changes in personnel policies, and improvement of managerial capacity at the various administrative levels. At the same time, financing has been sought from multilateral international agencies to strengthen the health infrastructure and support administrative reforms.

Since 1989, the Ministry has been carrying out an important project to strengthen the health districts within the framework of the strengthening of local health systems, in order to optimize local-level resources, through the active participation of the community. The project envisions involving districts from all the states and the Federal District by 1995.

A project on essential drugs is well advanced. In 1990, an initial list of essential drugs was drawn up that includes 380 active principals contained in 559 preparations, and in 1992, the national drug formulary was completed. In March 1991, a basic basket of drugs was created and regulations were established permitting the operation of "people's pharmacies." It is estimated that drug consumption in 1992 was the equivalent of approximately US\$ 500 million.

The Ministry's National Health Institute produces a substantial supply of biologicals, especially vaccines (DPT, tetanus toxoid, rabies, and measles). The school of pharmacy of the Central University produces antivenomous sera for treatment of snake bite and scorpion stings. In both cases, part of the production is exported to other countries in the Region.

Immunoprophylaxis and immunotherapy studies

for leprosy and leishmaniasis continue to be carried out at the Institute of Biomedicine.

Under the coordination of the Office for Emergency and Disaster Relief of the Ministry of Health and Social Welfare, contingency plans for emergency response have been formulated in collaboration with public and private agencies that have established mutual aid committees.

The epidemiologic situation in the Region of the Americas has undergone major changes in recent decades as the result of a complex set of processes that have altered the age structure of the population, the rate and extent of urbanization, the labor market, education levels, the ecological situation, and the organization of health services. More than any other factor, however, the situation has been influenced by the existence of deep social inequities and the growth of the population living in poverty.

This two-volume work describes the changes that have occurred, with emphasis on the period 1989–1992. The first volume presents a regional overview of the health situation in six chapters plus an annex of health and development indicators. The second volume is made up of country reports that summarize the salient processes and problems in each country.

The Pan American Health Organization hopes that the information offered in this publication will assist in decision-making and stimulate continued improvement of the generation, processing, and analysis of increasingly relevant and timely data to aid in framing health policies, reorganizing services, preventing and controlling diseases, and giving attention to priority problems.



PAN AMERICAN HEALTH ORGANIZATION
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