
HEALTH CONDITIONS IN THE AMERICAS

1990 Edition



VOLUME II

HEALTH CONDITIONS IN THE AMERICAS

1990 EDITION

Volume II



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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

Health Conditions in the Americas, 1990 edition, is the tenth publication in a series of quadrennial reports issued since 1954 as a way to document the health progress attained by the Member Governments of the Pan American Health Organization. This publication also presents to the XXIII Pan American Sanitary Conference an assessment of the health status of the Region's population in terms of the goal of health for all by the year 2000. This report does not include technical cooperation activities conducted between PAHO and its Member Governments; those activities are presented to this Conference in the *Report of the Director, Quadrennial 1986–1989, Annual 1989*.

As did previous publications in this series, this edition responds to the varied interests of many different users. It offers Member Governments and the Governing Bodies of PAHO information on the major health trends in the Region as a whole and in each one of the countries. In addition, it serves as a reference source for national and international organizations and for students, researchers, and health workers in the countries.

The 1990 edition's two volumes present information mainly for the 1985–1988 period. The first volume reports on health conditions from a regional perspective and comprises three parts and a statistical annex. The first part deals with the overall context: it describes some of the Region's political, economic, and social trends; the main demographic characteristics; and an overview of mortality and environmental health. The second part explores health conditions in the Region, focusing on children, adults, the elderly, and women, and health problems that affect the population in general. The third part, which examines the health systems infrastructure, describes the health sector's response to the problems that have been identified, and reports on the environmental health infrastructure in terms of water supply and sewerage, urban sanitation, environmental pollution, and occupational health. The annex to this volume is a compilation of the most up-to-date statistical data available, which supplement information published in previous reports and serve to document the text. The second volume summarizes the health conditions and infrastructure in each of the Region's countries; its analysis by subject area follows the organization of the first volume.

Data from many official and semiofficial sources were used to assemble both volumes. Despite every effort made to reconcile this information, not all discrepancies could be eliminated, and some of these may warrant concern. Nonetheless, we firmly believe in the importance of this information and we are convinced that its wider use will be the best incentive for generating, processing, and analyzing increasingly pertinent, valid, and timely data.

Carlyle Guerra de Macedo
Director

ANGUILLA

GENERAL CONTEXT

Political, Economic, and Social Situation

Anguilla is a British dependency with internal self-government. The Government of the United Kingdom is represented by a Governor, who retains responsibility for security and external affairs.

Anguilla's economy is increasingly based on tourism and financial services (offshore banking). The GDP per capita grew from \$US1,720 in 1984 to \$US2,470 in 1987, and unemployment is currently low.

Demographic Characteristics

In 1984, the population was 6,680 and is estimated to have grown to 6,806 in 1987. Significant emigration of the adult population has resulted in a population structure where 35% is under 15 years old and 10.3% is over age 65.

The birth rate was 26 per 1,000 population in 1984, and during 1985–1987 Anguilla maintained a birth rate between 22 and 26. In 1985, the fertility rate was 126.7 per 1,000 women aged 15–44. Less than 20% of total births were to women under the age of 20.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

Health Situation of Specific Population Groups

Child Health

Thirteen infant deaths during 1985–1987 give an average infant mortality rate of 25 per 1,000 live births. Seven of these were neonatal deaths, suggesting that, even within these small numbers, conditions arising in the perinatal period play a significant role. No other specific condition is listed as a leading cause of death; however,

respiratory tract infections remain the main cause for hospital admissions.

Diarrheal disease, though not a major problem, is still common; management by oral rehydration therapy is now widely applied.

Immunization coverage in children under 1 year old for diphtheria, pertussis, tetanus, poliomyelitis, tuberculosis, measles, mumps, and rubella was between 85% and 100%.

There were a total of five deaths in the age group 1–4 years old during 1985–1987.

A program of family life education for young people which includes peer counseling and skills training is becoming well established in the primary and secondary schools.

Health of Adolescents and Adults

Chronic noncommunicable diseases are the leading causes of death and chronic ill-health. The three leading groups of causes of death, in rank order, are cardiovascular disease, cerebrovascular disease, and malignant neoplasms. Hypertension and diabetes mellitus, the most prevalent chronic diseases, account for much of the clinic population, are responsible for many yearly hospital admissions, and significantly contribute to both cardiac and cerebrovascular deaths.

Of twenty-eight deaths among females in this age group, six were due to malignant neoplasms (21.4%), three to cerebrovascular disease (10.7%), three to diseases of the heart (10.7%), two to hypertension, and two to epilepsy. Cervical cancer is the leading malignancy among females.

After a drop in the number of women who participated in the family planning program in 1986, there was an increase to more than 600 in 1987. Condom use also has increased appreciably.

The demand for mental health care is growing. Accident-related deaths are not listed among the leading causes of death, but there was a steep rise in traffic accidents between 1975 (4.45/1,000) and 1984 (13.47/1,000); most involved motorcycles. Alcohol-related problems are apparently more frequent than previously noted. Chronic disability, although increasing, is not viewed as a significant problem. Blindness is the major adult disability.

Health of the Elderly

Cerebrovascular, cardiovascular, and malignant diseases are the main causes of death and chronic ill-health among the elderly.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

The Ministry of Health is responsible for the provision of public health services in the territory. Policy decisions for the health services are made by the Minister of Health on the advice of the Permanent Secretary for Health and of the senior technical officers. Day-to-day management responsibility is delegated to the Ministry's Permanent Secretary and, through him, to the technical and administrative staff within the Ministry, hospitals, and health centers.

A national health plan does not exist, but it is under consideration.

Anguilla's health system has developed over several years using the concept of three levels of care and incorporating a combination of primary and secondary health care services. Improvements in the organization of the tertiary care level are planned for the near future. Health care facilities are Government-owned.

Essential drugs are and will continue to be available at concessionary prices, but utilization patterns and quantity of drugs ordered will have to be monitored.

All services are free to pre- and postnatal clients, children in the 1-4-year-old age group, hypertensives, and diabetics. However, no services are offered during weekends or holidays.

Secondary care is provided at the 24-bed Cottage Hospital, which has an outpatient block complete with x-ray and other equipment and provides services in general surgery, general medicine, obstetrics, gynecology, and pediatrics. Supportive services include a laboratory, a pharmacy, and an x-ray department. Patients are usually referred to secondary care by nurses at the primary care level, by physicians who do a two-day clinic per week in each primary health care facility, or through the outpatient department of the hospital. There are 3.5 beds per 1,000 population. Services are provided on a fee-for-services basis, with the exception of maternal and child health. All infant deliveries are done in the maternity unit of the hospital. The bed occupancy ratio is about 50%.

Four government district health centers exist on the island. There is a 20-bed infirmary for the elderly supervised by the Cottage Hospital. Given the mortality pattern projected for the next ten years, geriatric care must increase, not only for the poor, but also for persons who can afford to pay and would like private care.

There is a modern dental clinic in the Valley, and efforts to establish preventive and restorative services are being undertaken.

The Valley Health Center serves a population of 2,930 and is staffed by two public health nurses, one community health aide, and one cleaning aide. South Hill, East End, and West End health clinics are each staffed with one nurse and one cleaning aide. The three public health inspectors at the Valley Health Center serve all districts. There are two doctors every week in each of the four clinics, so that the ratio of physician to population is 1:414 in West End, 1:1,493 in East End, 1:1,963 in South Hill, and 1:2,930 in the Valley.

Tertiary health care usually is not available on the island. However, specialized care services can sometimes be obtained from visiting specialists or by traveling to Antigua, Barbados, or Jamaica.

Anguilla has four government medical officers and two private medical practitioners. In addition, there are one health administrator, one dentist, two dental nurses, two dental auxiliaries, and four environmental health officers. Health manpower development has been identified as a priority need, and steps are being taken to train the personnel required for health services.

Special programs or services are available for the following priority groups: the elderly, the poor, the handicapped, and shut-ins. The elderly and shut-ins receive and have access to free medical and support services. Individuals and families are considered "poor" if they subsist on less than a minimum of \$US200 per month. They frequently lack utilities such as water and electricity in the home and do not have enough space to accommodate their families. These persons have free access to medical care and also receive \$US50 per month through the social welfare division of the Community Development Department. In 1985, there were 433 recorded old-age pensioners, 78 deprived persons, and 89 deprived and destitute children.

To get to a clinic takes at most 30 minutes walking or 10 minutes driving. More than 95% of the population has economic access to the clinics, and the remaining 5% gain access through the social welfare division. A fee is charged for each visit and for drugs. The secondary care facility, Cottage Hospital, is only a 10-minute drive away from the farthest village.

HEALTH AND THE ENVIRONMENT

Anguilla is undergoing considerable economic and social change. Its proximity to St. Maarten and its wealth of white sand beaches have led to strong growth in tourism in recent years. As a result, continued pressure for development of coastal areas can be expected for years to

come. The growth in tourism has brought with it several environmental issues which will have serious long-term implications if not addressed soon. The island's small population and limited resources are a constraint to accelerated environmental management, and its colonial status limits the external assistance it could seek from bilateral or other donor agencies.

Anguilla's water supply system currently has several problems, namely, the water's high alkaline content and leaks in the system. As demand for potable and nonpotable water increases, Anguilla undergoes pressure to ensure an adequate supply. Concern has been expressed regarding the potential contamination of an aquifer underlying the Town as a result of the growing inadequacy of septic tank systems as well as the ocean dumping of sewage.

With the growth in tourism, the volume of solid waste, much of it nonbiodegradable, has increased. This and the littering problem make solid waste management (collection, transportation, and disposal) an issue of growing concern. Damage to the coastal environment as a result of the dumping of solid waste into the sea has also been reported. Underlying these problems are some key structural problems, such as lack of environmental awareness in the public and private sectors; shortage of financial, manpower, and other resources; and inadequate land-use

planning and development controls.

The institutional capability for implementing a broad-based environmental health program is receiving attention, and increases in manpower and other resources are being considered. Efforts are being made to strengthen the legislative base of development control and to enforce existing environmental health ordinances such as the litter ordinance. Attention will also focus on updating legislation and ensuring its consistency. The roles of the public and the private sector in environmental health management have become increasingly understood, and in recent years, an education and awareness program has slowly developed to foster greater involvement from the public in such services.

The vector control program is vertically structured and heavily dependent upon the use of insecticides for the treatment of potential and actual breeding sites. Island-wide coverage of inspection and treatment is accomplished over a protracted period of approximately eight to ten months. Incorporated into the routine house-to-house activities is a program for stocking cisterns and other large containers with larvivorous fish. Some source reduction and health education activities have been carried out in recent times. Household infestation indices for *Aedes aegypti* remain high: 9.8% in 1988.

ANTIGUA AND BARBUDA

GENERAL CONTEXT

Political, Economic, and Social Situation

The country is a unitary state which includes Antigua, Barbuda, and the uninhabited islet of Redonda. The nation is governed as a constitutional monarchy with a parliamentary democracy, and it is a member of the British Commonwealth. The Government of the United Kingdom is represented in Antigua and Barbuda by a Governor General. The head of the Government is the Prime Minister.

Per capita GDP was \$US2,060 in 1983 and rose to \$US3,400 in 1987. Most economic activity, which is becoming increasingly service oriented, takes place in Antigua; tourism contributes significantly to the economy. The external debt grew from \$US62.7 million in 1983 to \$US180.7 million in 1986. The inflation rate was 9.2% for 1986, down from 15.7% in 1983. Available data indicate that unemployment in Antigua has decreased from 20.8% of the work force in 1983 to 5% in 1987; adult literacy is 90% and all eligible children aged 5–15 years are enrolled in school.

Demographic Characteristics

The 1987 estimated population was 81,000 inhabitants. The last census was conducted in 1970. There has been much migration into and from Antigua, and there are several population estimates. Because of this uncertainty and the absence of hard data, no attempt was made to analyze the demographic picture in Antigua and Barbuda; data which depend on demographic characteristics should be interpreted extremely cautiously.

Between 1985 and 1987, there was a consistent decrease in the number of births (from 1,200 to 1,100), reaching a birth rate of 14 per 1,000 population.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

Health Situation of Specific Population Groups

Child Health

Infant mortality rates fluctuated, from 24.4 per 1,000 live births in 1985 (29 deaths), to 12.4 in 1986 (14 deaths), and to 21.9 in 1987 (24 deaths). In each of these years, three of every four deaths occurred during the neonatal period, and the main causes of death were prematurity, congenital anomalies, and asphyxia. Among the few post-neonatal deaths, no pattern in the causes of death was discernible. Infant hospital admissions were mainly for gastroenteritis and respiratory tract infections. The proportion of infants with low birthweight (under 2,500 grams) was between 5% and 7.5%. Perinatal care standards improved significantly with the establishment of an upgraded unit at Holberton Hospital.

Coverage in the Expanded Program on Immunization (EPI) reached 96% to 100% for DPT and polio, and 90% for measles-mumps-rubella. BCG is not administered.

In the 1–4-year age group, there were a total of eight deaths between 1985–1987. The causes of admission to hospital were the same as for infants, in addition to “ingestion of poisonous substances.”

Health of Adolescents and Adults

Over the past two decades the five leading causes of mortality in this age group were, in order of importance: cerebrovascular disease, malignant neoplasms, heart disease, hypertensive disease, and diabetes mellitus; these causes have been responsible for approximately 60% of all deaths. Hypertension and diabetes are the two most prevalent of the chronic disorders and, in addition to their major contributions to mortality (hypertension is the most common cause of heart disease), they are the leading causes of chronic illness and prolonged hospital stays. Hypertension accounted for 36.7% of cases attending health centers in 1984, and diabetes for 14.5%. The high

prevalence of these two disorders may be related to the high levels of obesity recorded among women aged 40 and over. Prostate and gastric cancers are the leading malignancies among males and cervical cancer is the most common cancer among females. Motor vehicle accidents are an increasingly important cause of death; the number of fatalities from road traffic accidents has tripled over the past decade.

The proportion of births to teenage mothers was fairly constant at 24%, 22%, and 23%, for 1985, 1986, and 1987, respectively. Maternal mortality remains at a very low level, with only one death (in 1986) in the three years. There has been continuing integration of family planning into maternal and child health services, especially at the postnatal clinics. Family life education includes components on health and human sexuality. There are two offshoots of this program: a new adolescent health service and a peer counseling program for adolescents recently introduced in the Grays Farm District.

Long-term disabilities have been increasingly recognized. A national survey carried out by the Antigua Council for the Handicapped in the early part of the decade showed that blindness was the most common long-term adult disability and that hemiplegia ranked second.

Health of the Elderly

The elderly constitute about 7%–8% of the population. Most of the health problems in this group are due to chronic noncommunicable diseases, and hypertension is a common finding. Cerebrovascular, cardiovascular, and malignant diseases are the main causes of death and chronic ill-health. Most of the chronic disabilities (75%–85%) are found in this age group. Demand for mental health care is growing, and alcohol-related problems appear to be more frequent than previously realized.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

The Ministry of Health is responsible for the provision of public health services in the country. Policy decisions are made by the Minister of Health on the advice of the Permanent Secretary for Health and of the senior technical officers. The Minister of Health is responsible to the Cabinet of Ministers for the provision of government health services; day-to-day management of the health system is delegated to the Permanent Secretary and, through him, to the technical and administrative staff within the Ministry, hospitals, and health centers. Executive au-

thority is vested in a Cabinet comprising 14 Ministers of Government, which is headed by the Prime Minister. There are two Ministers of Health (one junior) in the Cabinet; the senior Minister also holds responsibility for Civil Service Affairs.

Although health care is not mentioned specifically as a fundamental right, the Constitution recognizes the need to protect the population from the spread of infectious diseases and from persons suspected to be of unsound mind or addicted to drugs or alcohol. The detention of such persons for care or treatment or for protection of the community shall not be deemed as an abrogation of their rights to personal liberty.

The country is divided into six medical districts; these divisions do not allocate services to the population on the basis of ratio of population to health facility or health worker. Legislation governing these divisions is outdated, particularly given the imbalances that have occurred with the rapid growth of the population and the expansion of cities and villages. Further, medical district boundaries do not coincide with geographic parish divisions or with environmental health or nursing districts. Property valuation and public utility authorities also have different divisions. These differing organizations lead to major coordination problems.

The medical districts are: St. John's City, Northern District, St. John's South, Windward District, St. Paul's, and St. Mary's. Each is served by a Government-appointed medical officer who has legal responsibility for providing all medical services in the district. All district medical officers have private practices as well, and their offices are located in St. John's. The 17 clinics that cover the country are related to one of six existing health centers (one in each district). Health center services are provided by the medical officer, family nurse practitioners, public health nurses, district nurse midwives, community health aides, and clinic aides. The maximum staff at the sub-centers and health centers comprises one of each category (with a part-time medical officer), and the minimum, a district nurse-midwife and a clinic aide. The services offered in the districts are maternal and child health/family planning, school health services, dental health, community mental health, and home visitation.

Although clinics are distributed throughout the country, there are large population segments that do not use the services. These middle and upper-middle class segments tend to go directly to private physicians for all their care. Generally there are no cultural barriers impeding access. Economic barriers also do not affect the public sector, since the provision of care does not depend on ability to pay at the time the service is rendered.

Estimates of the population served in each district were made in 1985 by the public health nurses, indicating that

the population served was about 76% of the total population. However, the ratio of population to facility ranged from 1,215 to 10,000 (most are under 1,700). In some instances the system has grown solely as a reaction to political or community demands.

Primary and secondary care levels basically define the health services in Antigua, but there are no clear demarcations between them, and primary services are offered in the acute secondary care institution, Holberton Hospital. Tertiary levels of care are occasionally provided, but most cases requiring complex care receive such treatment abroad. There are official links with the University of the West Indies in Jamaica and with Queen Elizabeth Hospital in Barbados, and more and more patients are being sent to Puerto Rico and Miami for general tertiary care and to Martinique and Guadeloupe for ophthalmology services.

The Ministry of Health's institutions comprise Holberton Hospital, a 210-bed general acute care institution; the Mental Hospital, which has 150 beds; the Fiennes Institute, a geriatric home of 100 beds; and the Pearn's Leper Home, a 4-bed leprosarium. The private sector includes the Adelin Clinic, a nine-bed facility with a well-equipped operating theater and x-ray facilities; delivery services are also provided at this clinic.

Holberton Hospital is divided into ten wards, including a small ward for treatment of tuberculosis. A new 25-bed pediatric unit is near completion, and a new mortuary and additional laboratory space are under construction. In the last four years, a central sterile supply unit has been built, and a six-bed intensive care/recovery room has been added to the operating theater building.

Referrals to the single secondary institution are direct; referrals and emergency services are available on a 24-hour basis. Recently, the transmission of information from the hospital to the districts has improved.

Many of the clinics are underutilized. District medical officers cover three clinics weekly on the average, serving around 19 patients per clinic of one to two hours' duration. In some areas, antenatal or postnatal clinics attract one or two clients per session. Even though patients see doctors in their districts, at this time they need to journey to St. John's to receive x-ray, laboratory, or drug services; consequently, many patients come straight to St. John's for all services. In 1979-1980 a district service model, which included laboratory and drug services, was introduced in St. John's South. However, efforts to maintain it lost momentum.

No special programs or services exist for the priority

groups mentioned in the official policy, such as the elderly, the poor, workers, or the handicapped.

HEALTH AND THE ENVIRONMENT

Growing tourism has resulted in an increase of solid and liquid waste, and yet demands for a high level of environmental quality also have risen. At peak periods the local infrastructure of environmental works and services is taxed beyond its capacity.

Drought and other water supply problems experienced in the last decade appear to have been solved through a USAID water project which ended in March 1988. No communal sewerage system exists anywhere in Antigua; in the capital, St. John's, sewage is disposed of by septic tank and excreta is stored and removed by the bucket or pail system. Coastal hotels, some of which are quite large, use package sewage treatment plants, but they suffer from unprofessional operation and maintenance. Outdated services collect, transport, and dump solid waste in low-lying land outside the city. The services lack the professional attention required to manage and dispose of wastes in a sanitary manner.

The structural problems underlying these issues are: lack of environmental awareness in both the public and private sectors; lack of environmental (health) baseline data; weak and fragmented environmental administration with an outdated legislation base; no land-use planning program; and no environmental impact assessment requirements.

Institutional strengthening for environmental management is receiving increased attention in terms of improved information management, increased coordination, and greater private sector involvement. A 1986 study pointed out that environmental legislation needs to be updated, both in terms of health and of natural resources. The country has benefited from the USAID water project with improvements to groundwater and surface systems, and a renovated water desalinization plant. Funding is being sought for a St. John's sewerage system, and improvements in the management and disposal aspects of solid waste are being attempted. In Barbuda, USAID and PAHO have helped to develop a privy construction program. The vector control program on Antigua is organized along traditional lines and achieves island-wide cycles of inspection and focal treatment every three months. On Barbuda there is no organized program. The latest *Aedes* household infestation index for Antigua (1989) was 14%.

ARGENTINA

GENERAL CONTEXT

Political, Economic, and Social Situation

From a political and social point of view, the 1985–1988 quadrennium must be viewed as a period of democratic transition. After several decades without an uninterrupted constitutional framework, by the end of 1983 a democratically elected civilian government was installed. During this period of transition and adjustment, freedoms were recovered and a civilian government, democratic institutions, and the system of justice began functioning once again.

These changes posed difficulties in that regulations, judicial and administrative procedures, and governmental, cultural, and information functions required reassessment. In addition, this period witnessed confrontations, especially military ones, that generated profound social and political tensions.

Political conflicts were exacerbated after the failure of the Plan Austral, despite this Plan's promising beginnings during the last half of 1985. The 1987 elections for governors and members of the legislature already reflected the government party's erosion of popularity. A new inflationary surge in 1988 and the government party's lack of political and sectoral alliances and its minority representation in parliament sealed a total loss of confidence in its ability to politically and economically control the situation. In this context, the presidential candidate for the leading opposition party was elected in May 1989. Given the underlying uncertainty in the country, and in order to prevent an irreversible deterioration, the transfer of power, with fully functioning democratic institutions, was moved up to July of that year.

In 1988, the economic crisis worsened and per capita GDP decreased (–0.85%), after years in which it had increased (4.4% in 1986 and 0.3% in 1987); the overall change for 1981–1988 was –15.2%. Inflation more than doubled compared to the previous year (it was 372% in 1988; 175% in 1987; 82% in 1986; and 385% in 1985). The recurrent macroeconomic imbalances associated with the external debt service, the fiscal crisis, and the scarcity of foreign exchange are reflected in growing inflationary pressures, low levels of investment, and the economic policy's restricted capability to yield results.

The rise in the value of exports, as a consequence of the rise in international prices for non-energy commodities and the significant increase of total exports, did not promote greater growth because a proportion of the additional exports was earmarked to pay for more imports and most was used to finance the increased transfer of resources abroad.

The negative consequences of major imbalances of public finances and of the growing inflation and efforts to control it played a major role in the loss of economic activity. In 1987 and 1988, this loss and an increased inflation occurred just as foreign trade improved. As a result of the rising international prices for several commodities and the growth in manufactured goods exports, the total value of sales of goods abroad rose 35%.

Since 1982, exports have outpaced imports, leading to a favorable balance of trade: \$US2.4 billion in 1986, \$US1.0 billion in 1987, and \$US3.3 billion in 1988. This expansion of the trade surplus was not sufficient to finance the net payments of interest and profits, which rose to \$US4.4 billion in 1986, \$US4.5 billion in 1987, and \$US4.6 billion in 1988. The greater trade surplus reduced the current accounts deficit from –\$US4.3 billion in 1987 to –\$US2.0 billion in 1988. In contrast, there was a clear increase in net capital earnings (\$US2.0 billion in 1986, \$US2.6 billion in 1987, and \$US3.5 billion in 1988). Because of this, after two years of a negative balance of payments, the balance of payments in 1988 was positive (\$US1.5 billion).

The GDP, which had barely increased in 1987, rose a mere 0.5% in 1988, to a level 5% lower than in 1980. The almost complete stagnation of economic activity resulted from a combination of significant increases in agricultural and livestock exports and declines in industry (–3%) and construction (–8%). Nevertheless, the increase in industrial exports helped stem the drop in production of those activities with greatest access to foreign markets. The agricultural and livestock sector grew 7% in 1988, thanks to a recovery of agricultural production that had been damaged by unfavorable climatic conditions. In 1988, unemployment increased for the second consecutive year, ranging from 7% to 8% for the main cities (Rosario, Córdoba, the Federal Capital, and Greater Buenos Aires).

The external debt continued to increase, from \$US46.9 million in 1984 to \$US56.8 million in 1988. Involuntary

loans imposed on private and public creditors due to late interest payments were responsible for much of the debt expansion. In 1988, the United States Treasury mobilized \$US1.05 billion in bridge loans for Argentina, which were reimbursed with resources from new credits granted by the World Bank and the International Monetary Fund.

In the course of the decade, and especially during the 1985–1988 quadrennium, the management of economic policy became increasingly difficult. Public finances faced revenue contractions, pressures on expenditures (especially those associated with servicing the growing public debt), a decline in real revenues, and a deepening inflation. In addition, it has been increasingly difficult to overcome obstacles such as outdated educational systems, inefficient agrarian systems, insufficient application of technical progress to the productive process, and anachronistic financial and tax systems. Moreover, the social costs of the recession, coupled with inflation and deteriorating public social services, have exacerbated pre-existing inequalities.

The availability of additional foreign exchange did not yield greater fiscal revenues, because the tax systems do not attract the growing exporter profits.

Demographic Characteristics

The overall fertility rate, which reached 3.15 children per woman for 1970–1975, was 3.36 for 1975–1980 and 3.15 for 1980–1985; projections for 1985–1990 place the figure at 2.96. According to estimates and projections of the National Institute of Statistics and Censuses (INDEC)-CELADE, the population was estimated at 31,534,100 for 1988 and 32,321,900 for 1990. For 1985–1990, the birth rate was estimated at 21.4 per 1,000 population, and mortality at 8.6 per 1,000 population. The median age increased from 25.7 years in 1950 to 27.6 in 1985, and will reach 28.4 by the year 2000.

While the total population grew 14.5% from 1980 to 1990, the group of children under 5 years old diminished in both absolute and relative terms (Table 1). The age groups that show the greatest growth are those 65 years old and older (27.6%) and the 5–14-year-olds (23.0%). In 1990, the female population 65 years and older will exceed the female population under 5 years old (10.4% as compared with 9.7% of the total female population). Given the growth of the 15–44-year-old and the 5–14-year-old age groups, no reduction in the number of births is expected unless there are notable changes in fertility, although there may be a small reduction in the crude birth rate (from 23 in 1980–1985 to 20 in 1995–2000). The male-female ratio changed little during the decade.

The urbanization process will continue, albeit at a

slower pace than in the past. The urban population (those who live in localities with 2,000 or more inhabitants), which in 1980 constituted 83% of the total population, will account for 88% by the year 2000.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

Based on a 1982 study that used data from the 1970 and 1980 censuses, INDEC estimated the underregistration of births for 1975–1980 at 2%. There are no recent estimates or partial studies that indicate that this figure has changed. In 1985, 51.4% of births were males. That same year, 93.4% of all births occurred in health care establishments and 5.4% in homes.

According to INDEC studies, the underregistration of total mortality for 1975–1980 was 2%. Underregistration, however, is not even throughout the country: for children under 5 years old in 1980–1981, it was 3% for the entire country, and more than 10% for the provinces of Formosa, Jujuy, La Pampa, San Luis, Santa Cruz, and Santiago del Estero.

Of 233,071 deaths registered in 1982, 99.3% were medically certified; this indicator is greater than 99% in 12 jurisdictions. Of total deaths, 2.4% nationwide were attributed to signs, symptoms, and ill-defined conditions, but there are significant differences among jurisdictions: in the Federal Capital and the provinces of Buenos Aires, La Pampa, Mendoza, and San Juan, this cause was named in less than 1% of deaths, but in the provinces of Jujuy and Salta it exceeds 10%, and in Santiago del Estero it is almost 25%. If in addition to the deaths attributed to that group one includes those death certifications rejected due to lack of correspondence among cause, age, and sex or because they were attributed to codes that do not appear in the *International Classification of Diseases*, Ninth Revision (ICD-9), the nationwide percentage would exceed 3%.

Another noteworthy aspect in the certification of causes of death is the weight of some categories, which, although they are not among the ill-defined categories in ICD-9, are terminal states that may result from various diseases. These include cardiopneumatic arrest and cardiac insufficiency, which in 1985 accounted for more than 50% of male cases and almost 60% of female cases of mortality from diseases of the heart. Since diseases of the heart cause almost 40% of mortality, 20% to 25% of all deaths result from one of the two aforementioned diseases. For 1969–1970, under the ICD-8, these two diagnoses accounted for less than 30% of mortality due to diseases of the heart.

| | 1980 | | 1985 | | 1990 | | Growth 1980-1990 % |
|-----------------------|------------|------|------------|------|------------|------|--------------------------|
| | No. | % | No. | % | No. | % | |
| Total | 28,237,149 | 100 | 30,331,283 | 100 | 32,321,887 | 100 | 14.5 |
| Male | 14,045,471 | 100 | 15,045,534 | 100 | 16,001,997 | 100 | 14.0 |
| Female | 14,191,678 | 100 | 15,285,749 | 100 | 16,319,890 | 100 | 15.0 |
| Male-female ratio | | 99 | | 98 | | 98 | |
| Under 5 years old | 3,241,127 | 11.5 | 3,240,084 | 10.7 | 3,229,187 | 10.0 | -0.37 |
| Male | 1,645,984 | 11.7 | 1,645,921 | 10.9 | 1,640,677 | 10.3 | -0.32 |
| Female | 1,595,143 | 11.2 | 1,594,163 | 10.4 | 1,588,510 | 9.7 | -0.42 |
| Male-female ratio | | 103 | | 103 | | 103 | |
| 5-14 years old | 5,239,202 | 18.6 | 6,000,554 | 19.8 | 6,441,585 | 19.9 | 23.0 |
| Male | 2,657,446 | 18.9 | 3,044,924 | 20.2 | 3,269,775 | 20.4 | 23.0 |
| Female | 2,581,756 | 18.2 | 2,955,630 | 19.3 | 3,171,810 | 19.4 | 22.9 |
| Male-female ratio | | 103 | | 103 | | 103 | |
| 15-44 years old | 12,091,058 | 42.8 | 12,848,651 | 42.4 | 13,812,738 | 42.7 | 14.3 |
| Male | 6,111,127 | 43.5 | 6,493,295 | 43.2 | 6,978,740 | 43.6 | 14.2 |
| Female | 5,979,931 | 42.1 | 6,355,356 | 41.6 | 6,833,998 | 41.9 | 14.3 |
| Male-female ratio | | 102 | | 102 | | 102 | |
| 45-65 years old | 5,358,553 | 19.0 | 5,631,185 | 18.6 | 5,893,778 | 18.2 | 10.9 |
| Male | 2,614,328 | 18.6 | 2,738,757 | 18.2 | 2,864,669 | 17.9 | 9.6 |
| Female | 2,744,225 | 19.3 | 2,892,428 | 18.9 | 3,029,109 | 18.5 | 10.4 |
| Male-female ratio | | 95 | | 95 | | 95 | |
| 65 years old and over | 2,307,209 | 8.2 | 2,610,810 | 8.6 | 2,944,601 | 9.1 | 27.6 |
| Male | 1,016,586 | 7.2 | 1,122,638 | 7.5 | 1,248,138 | 7.8 | 22.8 |
| Female | 1,290,623 | 9.1 | 1,488,172 | 9.7 | 1,696,463 | 10.4 | 31.5 |
| Male-female ratio | | 79 | | 75 | | 74 | |

Source: Based on data from the publication *Estimaciones y proyecciones de 1950-2025* (Estimates and projections for 1950-2025), INDEC-CELADE.

Another factor that may affect the analysis of mortality relates to deaths in which age is unknown. There were 7,229 such deaths in 1982, 7,951 in 1983, 4,040 in 1984, and 4,451 in 1985. If those deaths were distributed according to the structure of the causes of death, infant mortality would increase from 5% to 10%, depending on the year.

The proportion of mortality in the age group 65 years old and older for 1970, 1980, and 1985 (45.6%, 55.5%, and 59.2%, respectively) continued to increase, while the proportion among children under 5 years old decreased. For this latter age group, the percentage declined from 16.7% in 1970 to 8.4% in 1985. In 1985, two of every three female deaths were women over 65 years of age (Table 2).

An analysis of the structure of mortality by causes in 1970, 1980, and 1985 shows the reduced role of infectious and parasitic diseases, nutritional diseases, and other environmental-related ailments as causes of mortality. There also has been a slight increase in the percentage of deaths due to neoplasms and diseases of the circulatory system, which together account for 64.2% of mortality, while the relative importance of the group of other chronic and degenerative diseases has held steady (Table 3).

The causes of death related to early infancy dropped slightly (0.7% from 1980 to 1985), indicating the beginning of a downward trend in neonatal mortality. Deaths in infants under 28 days old fell from 13,016 in 1980 to 10,659 in 1985; in other words, neonatal mor-

| Age group (years) | Total | | | Men | | | Women | | |
|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 1970 | 1980 | 1985 | 1970 | 1980 | 1985 | 1970 | 1980 | 1985 |
| All ages | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Under 5 years | 16.7 | 11.5 | 8.4 | 15.4 | 11.1 | 8.5 | 18.6 | 11.8 | 8.2 |
| 5-44 years | 12.4 | 9.7 | 9.1 | 13.2 | 10.5 | 10.2 | 11.3 | 8.6 | 7.7 |
| 45-64 years | 25.4 | 23.4 | 23.4 | 28.9 | 27.5 | 27.7 | 20.4 | 18.0 | 17.9 |
| 65 and over | 45.6 | 55.5 | 59.2 | 42.5 | 50.9 | 53.7 | 49.7 | 61.6 | 66.2 |

Source: Based on data from the National Health Statistics Program.

| Group of causes (ICD-9) | Year | | |
|---|-------|-------|-------|
| | 1970 | 1980 | 1985 |
| Diseases of the circulatory system (390-459) | 37.7 | 45.1 | 46.1 |
| Neoplasms (140-239) | 15.7 | 16.7 | 18.1 |
| Infectious and parasitic diseases, nutritional deficiencies, pneumonia and influenza, and meningitis (001-139, 260-269, 480-487, 320-322) | 13.1 | 8.0 | 6.1 |
| Diabetes, ulcers, cirrhosis, bronchitis, emphysema, asthma, and nephritis and nephrosis (250, 531-533, 571, 490-493, 580-589) | 6.2 | 6.3 | 6.4 |
| Congenital anomalies and conditions originating in the perinatal period (740-779) | 4.6 | 5.5 | 4.8 |
| Accidents and acts of violence (E800-E999) | 7.7 | 6.6 | 6.2 |
| All other defined causes | 8.4 | 7.8 | 9.0 |
| Signs, symptoms, and ill-defined conditions (780-799) | 6.7 | 4.0 | 3.3 |
| All causes | 100.0 | 100.0 | 100.0 |

rality diminished from 18.8 per 1,000 live births in 1980 to 16.8 per 1,000 in 1985 (a 10% reduction). The group of external causes of death continues to drop slowly, more among males than females.

If the leading causes of death for deaths of persons aged 0 to 64 years old are analyzed nationwide and by jurisdictions, using the technique of years of potential life lost (YPLL), some geographical differences show up (Table 4). Even though the leading cause group for the country as a whole is "diseases originating in the perinatal period," with 23.6% of the total YPLL, in six provinces the leading cause is "certain infectious diseases" (basically diarrhea and diseases preventable by vaccination), with percentages ranging from 23% to 31% of the total YPLL. This latter group constitutes the second leading cause nationwide and in seven other jurisdictions. The Federal

Capital's age group structure and its greater relative development are responsible for making diseases of the heart the leading cause group there, followed, in descending order, by diseases originating in the perinatal period, neoplasms, and certain infectious diseases.

Some results from the application of the life tables technique to study the effect of mortality by cause, sex, and age on life expectancy at birth are illustrated below. Two periods were considered in this analysis: 1969-1970 and 1982-1983. In the intervening years, life expectancy at birth for males increased 5.225 years (1,908 days), and for females, 4.652 years (1,698 days) (Table 5). The days gained by reducing mortality in children under 1 year old (809 days for males and 819 for females) represented 42.4% and 48.2%, respectively, of the total gained.

The male population has had more gains than the fe-

| Jurisdiction | 1 st | % | 2 nd | % | 3 rd | % | 4 th | % | 5 th | % |
|---------------------|-----------------|------|-----------------|------|-----------------|------|-----------------|-------|-----------------|------|
| Total country | PER | 23.6 | INF | 15.5 | ACC | 12.4 | COR | 10.6 | TUM | 9.5 |
| Federal Capital | COR | 18.8 | PER | 18.6 | TUM | 17.0 | ACC | 9.1 | INF | 7.1 |
| Buenos Aires | PER | 22.7 | COR | 13.0 | ACC | 12.1 | INF | 11.6 | TUM | 11.5 |
| Catamarca | PER | 29.7 | INF | 22.9 | ACC | 13.4 | COR | 9.4 | TUM | 6.0 |
| Córdoba | PER | 20.7 | ACC | 15.9 | INF | 13.4 | COR | 11.7 | TUM | 11.4 |
| Corrientes | INF | 27.1 | PER | 22.2 | ACC | 10.7 | COR | 7.2 | TUM | 5.3 |
| Chaco | INF | 31.1 | PER | 24.4 | ACC | 8.0 | COR | 5.5 | CGN | 5.3 |
| Chubut | PER | 26.6 | INF | 16.5 | ACC | 15.1 | COR | 9.2 | TUM | 6.7 |
| Entre Ríos | PER | 35.1 | COR | 11.1 | INF | 10.7 | SUI | 110.3 | TUM | 9.2 |
| Formosa | INF | 27.9 | PER | 27.9 | ACC | 9.7 | COR | 7.0 | TUM | 5.6 |
| Jujuy | INF | 26.4 | PER | 19.6 | ACC | 13.9 | DSN | 8.0 | TUM | 4.9 |
| La Pampa | PER | 24.4 | ACC | 14.3 | INF | 12.7 | TUM | 12.4 | COR | 10.0 |
| La Rioja | PER | 31.1 | INF | 20.1 | COR | 11.6 | ACC | 10.2 | TUM | 5.2 |
| Mendoza | PER | 26.8 | INF | 16.1 | ACC | 15.7 | TUM | 8.2 | COR | 7.3 |
| Misiones | PER | 25.7 | INF | 22.9 | ACC | 11.2 | DSN | 6.1 | COR | 5.5 |
| Neuquén | PER | 22.3 | ACC | 21.3 | INF | 13.2 | TUM | 7.2 | CGN | 7.0 |
| Río Negro | PER | 20.8 | ACC | 19.5 | INF | 16.6 | COR | 8.9 | TUM | 6.7 |
| Salta | INF | 27.3 | PER | 22.7 | ACC | 10.4 | COR | 5.2 | DSN | 4.8 |
| San Juan | PER | 27.1 | INF | 17.4 | ACC | 17.3 | TUM | 7.3 | CGN | 7.1 |
| San Luis | PER | 33.5 | INF | 18.7 | ACC | 11.0 | COR | 9.0 | TUM | 5.7 |
| Santa Cruz | PER | 21.9 | ACC | 21.1 | INF | 10.9 | COR | 9.8 | TUM | 6.4 |
| Santa Fe | PER | 26.0 | ACC | 13.9 | INF | 13.3 | TUM | 11.6 | COR | 8.5 |
| Santiago del Estero | INF | 23.5 | PER | 14.6 | COR | 13.3 | ACC | 10.7 | TUM | 6.1 |
| Tucumán | PER | 23.7 | INF | 21.7 | ACC | 10.6 | COR | 8.7 | TUM | 5.6 |

Note: The acronyms are as follows: INF: certain infectious diseases (intestinal infectious diseases, tuberculosis, diphtheria, whooping cough, tetanus, septicemia, acute poliomyelitis, measles, meningitis, trypanosomiasis, viral hepatitis); TUM: neoplasms; DSN: nutritional deficiencies and anemias; COR: diseases of the heart; CGN: congenital anomalies; PER: certain conditions originating in the perinatal period; ACC: accidents; SUI: suicide.

male population; total years of life have increased for both, as shown in Table 5 for the age groups 55–64 years old and 65–74 years old of both sexes. A breakdown of this gain by major groups of causes revealed that infectious and parasitic diseases, influenza and pneumonia, and nutritional deficiencies account for 768 days for males and 758 days for females, reflecting 40% and 45%, respectively, of the total gain (Table 6).

The profiles by sex are similar: there were improvements in diseases of the heart for men, but a deterioration among women, and there were improvements among men from a reduction in the group “external causes” (accidents and violent acts). In overall terms, these two dif-

ferences explain the greater male gains. The minor improvement observed in birth defects and diseases originating in the perinatal period, reflects the stagnation of death rates in the first years of life for the period covered by the study. Malignant neoplasms and cerebrovascular diseases clearly improved for both sexes.

Geographical differences in life expectancy at birth have diminished (Table 7). From 1959 to 1961 the gap was 20.9 years (71.3 years in the Federal Capital and 50.4 years in Jujuy), while for 1980–1981 it fell to 8.5 years for the same provinces. The provinces with the greatest increases in the period were Neuquén (13.5 years), Jujuy (13.4 years), and Río Negro (10.4).

TABLE 5

Gain (in days) in life expectancy at birth, by age group and by sex, from 1969–1970 to 1982–1983, Argentina.

| Age group (years) | Men | Women |
|-------------------|-----------------------------|-----------------------------|
| Under 1 | 809 | 819 |
| 1–4 | 155 | 180 |
| 5–14 | 66 | 52 |
| 15–24 | 96 | 83 |
| 25–34 | 122 | 90 |
| 35–44 | 119 | 69 |
| 45–54 | 127 | 80 |
| 55–64 | 165 | 123 |
| 65–74 | 220 | 209 |
| 75 and over | 29 | –7 |
| Total | 1,908 days (5.225 years) | 1,698 days (4.652 years) |

TABLE 6

Gain (in days) in life expectancy at birth, total and by groups of causes, by sex, from 1969–1970 to 1982–1983, Argentina.

| Groups of causes | Men | Women |
|--|-------|-------|
| All causes | 1,908 | 1,698 |
| Infectious and parasitic diseases (001–139) | 462 | 439 |
| Malignant neoplasms (140–208) | 147 | 137 |
| Diabetes (250) | 24 | 43 |
| Nutritional deficiencies (260–269) | 61 | 55 |
| Diseases of the heart (390–429) | 51 | 28 |
| Cerebrovascular disease (430–438) | 67 | 92 |
| Influenza and pneumonia (480–487) | 245 | 264 |
| Liver disease and cirrhosis (571) | 43 | 26 |
| Accidents and acts of violence (E800–E999) | 210 | 58 |
| Congenital anomalies (740–759) | 9 | 4 |
| Conditions originating in the perinatal period (760–779) | 9 | 4 |
| All other defined causes | 257 | 204 |
| Signs, symptoms, and ill-defined conditions (780–799) | 322 | 380 |

Health Situation of Specific Population Groups

Child Health

Throughout the decade, infant mortality continued to diminish, although at a slower pace than in the previous decade; the low level that had been reached, slows the reduction rate (see Table 7). While in 1970 the difference between the range was 116.1 (147.4 per 1,000 live births in Jujuy and 31.3 per 1,000 in the Federal Capital), in 1981 it declined to 33.7 (51.4 per 1,000 in Salta and 17.7 in the Federal Capital), and further decreased to 20.2 in 1987 (35.7 per 1,000 in Formosa and 15.5 in the Federal Capital).

Table 8 shows the breakdown by sex of the increase in life expectancy at birth (in days) from 1969–1970 to 1980–1983, as a result of reductions in infant mortality due to a large group of causes. There are almost no differences in the profiles by sex. The greatest gains were due to reductions in two categories: infectious and parasitic diseases and influenza and pneumonia. These causes are responsible for 62% of the observed gain. However, the structures of neonatal mortality (infants younger than 28 days) and postneonatal mortality (28 days old to 11 months old) varied little; neonatal mortality accounted for 56.2% of total infant deaths in 1980 and 58.1% in 1985 (in 1970 it accounted for 41.4% of infant deaths).

In 1987, two provinces registered less than 65% coverage for polio vaccine, although nationwide coverage was 85%. For DPT there were six provinces with less than 65% coverage, while nationwide coverage was 75% (Table 9).

Mortality in the age group 1–4 years old dropped from 3.3 per 1,000 children of that age group in 1970 to 1.0 in 1985. This is due basically to a reduction of mortality due to infectious and parasitic diseases (mainly diarrhea), and to influenza and pneumonia; these two categories combined are responsible for 60% of the reduction. In 1982–1983, accidents and violent acts ranked as the leading cause of death for both sexes in this age group, after having been the third leading cause (far behind the first two, infectious and parasitic diseases and influenza and pneumonia) in 1969–1970. Among males in 1982–1983, the number of deaths from accidents and violent acts exceeded the deaths from all other causes combined (Table 10).

In the age group 5–14 years old, death rates diminished in both sexes (Table 11), and in 1985 declined to almost half the figures for 1969–1970. Beginning with this age group mortality in men is markedly higher, due primarily to external causes. The death rates from defined causes fell for all causes, with most improvements occurring in infectious diseases, influenza and pneumonia, and acci-

| Jurisdiction | Life expectancy | | Infant mortality | | |
|---------------------|-----------------|-----------|------------------|-------|-------------------|
| | 1959–1961 | 1980–1981 | 1970 | 1981 | 1987 ^a |
| Total country | — | — | 62.0 | 33.6 | 26.0 |
| Federal Capital | 71.29 | 72.23 | 31.3 | 17.7 | 15.5 |
| Buenos Aires | 66.47 | 69.49 | 56.8 | 33.1 | 24.8 |
| Catamarca | 62.84 | 66.72 | 70.9 | 43.9 | 30.9 |
| Córdoba | 65.67 | 70.82 | 50.4 | 24.9 | 25.5 |
| Corrientes | 61.46 | 65.38 | 78.9 | 44.7 | 27.7 |
| Chaco | 60.37 | 64.44 | 97.4 | 48.0 | 33.0 |
| Chubut | 56.47 | 66.26 | 83.1 | 36.9 | 22.9 |
| Entre Ríos | 66.58 | 68.01 | 59.1 | 31.1 | 22.7 |
| Formosa | 65.45 | 65.96 | 57.2 | 40.1 | 35.7 |
| Jujuy | 50.37 | 63.77 | 147.4 | 47.5 | 35.3 |
| La Pampa | 66.88 | 67.97 | 40.6 | 37.4 | 21.3 |
| La Rioja | 63.24 | 66.82 | 85.5 | 42.5 | 31.0 |
| Mendoza | 64.68 | 70.12 | 55.1 | 25.9 | 22.3 |
| Misiones | 63.12 | 65.23 | 76.7 | 47.9 | 23.5 |
| Neuquén | 54.18 | 67.68 | 106.5 | 29.5 | 23.6 |
| Río Negro | 56.87 | 67.26 | 92.6 | 37.6 | 25.6 |
| Salta | 55.48 | 64.18 | 109.0 | 51.4 | 30.8 |
| San Juan | 63.16 | 67.40 | 80.0 | 32.4 | 24.6 |
| San Luis | 62.63 | 67.86 | 74.0 | 36.5 | 24.9 |
| Santa Cruz | 62.81 | 65.21 | 54.7 | 32.8 | 21.6 |
| Santa Fe | 66.68 | 70.03 | 56.2 | 32.2 | 28.0 |
| Santiago del Estero | 63.22 | 65.60 | 76.4 | 31.12 | 24.5 |
| Tucumán | 60.65 | 67.04 | 73.8 | 37.2 | 27.8 |

^aProvisional.

Sources: Life expectancy at birth 1959/1961: Life Tables, Series 3, No. 1, Department of Health Statistics, Buenos Aires, 1970. Life expectancy at birth 1980/1981: Mortality Tables 1980/81, INDEC, Buenos Aires, 1988. Infant mortality: National Health Statistics Program, Buenos Aires, several years.

dents and violent acts. This last group is responsible for 50% of male mortality and 31% of female mortality.

Health of Adolescents and Adults

The analysis of mortality in the age group 15–64 years old faces the difficulties typical of a very heterogeneous population group. The rates are highly variable by age and sex (see Table 11), and the structure of mortality by sex also differs greatly. From 1969 to 1985, all rates by age and sex diminished appreciably, particularly those for persons aged 15 to 44 years old for both sexes. For both men and women in recent years (1982–1985), the in-

crease in rates by age has been geometric beginning at 35 years, and the increase is more than 100% for the older age groups; thus, in 1985 for women, the rates were 97.1, 202.0, 415.6, and 907.2 per 100,000 for the age groups 25–34 years old, 35–44 years old, 45–54 years old, and 55–64 years old, respectively.

In the age group 15 to 29 years old, accidents (the leading cause) and mental diseases (the second leading cause) accounted for 50% of mortality. In the age group 30–44 years old, cardiovascular and cerebrovascular diseases rank first, but unlike in the first age group (15–29-year-olds, with a predominance of accidents and mental diseases), among 30–44-year-olds, more than two groups

TABLE 8

Gain (in days) in life expectancy at birth, in children under 1 year old, by groups of causes and by sex, from 1969–1970 to 1980–1983, Argentina.

| Groups of causes | Men | Women |
|--|-----|-------|
| All causes | 809 | 819 |
| Infectious and parasitic diseases (001–139) | 314 | 313 |
| Malignant neoplasms (140–208) | 1 | 1 |
| Nutritional deficiencies (260–269) | 49 | 54 |
| Diseases of the heart (390–429) | 8 | 14 |
| Cerebrovascular disease (430–438) | 7 | 9 |
| Influenza and pneumonia (480–487) | 195 | 192 |
| Accidents and acts of violence (E800–E999) | 6 | 13 |
| Congenital anomalies (740–759) | 4 | 3 |
| Conditions originating in the perinatal period (760–779) | 23 | 17 |
| All other defined causes | 154 | 168 |
| Signs, symptoms, and ill-defined conditions (780–799) | 94 | 79 |

TABLE 9

Vaccination coverage (%) with complete doses in children under 1 year old, Argentina, 1985 to 1987.

| Vaccine | 1985 | 1986 | 1987 |
|---------------|------|------|------|
| Poliomyelitis | 68.6 | 79.0 | 85.4 |
| DPT | 62.6 | 67.0 | 75.1 |
| Measles | 67.1 | 87.0 | 79.7 |
| BCG | 88.5 | 89.8 | 94.2 |

Sources: Expanded Program on Immunization (PAHO/WHO) and National Program on Immunization.

of causes are responsible for 50% of mortality. Beginning at 45 years (the third age group) cardiovascular and cerebrovascular diseases and neoplasms (first and second causes) account for more than 50% of deaths; these causes increase progressively in older age groups.

Despite the significant underregistration of maternal mortality, which could reach 50%, both maternal deaths and neoplasms that affect only females occur so frequently that they rank among the leading causes of overall mortality by age; the latter are the fifth leading cause of death beginning at 35 years and the third leading cause beginning at age 50 years; they maintain third place up to the

TABLE 10

Percentage distribution of deaths of children 1 to 4 years old, by groups of causes and by sex, Argentina, 1982–1983.

| Groups of causes | Men | Women |
|---|-------|-------|
| All causes | 100.0 | 100.0 |
| Accidents and acts of violence (E800–E999) | 28.5 | 17.8 |
| Infectious and parasitic diseases (001–139) | 14.5 | 15.7 |
| Influenza and pneumonia (480–487) | 7.3 | 9.0 |
| Nutritional deficiencies (260–269) | 6.9 | 8.4 |
| Congenital anomalies (740–759) | 5.1 | 6.7 |
| Diseases of the heart (390–429) | 6.0 | 5.8 |
| Malignant neoplasms (140–208) | 5.1 | 4.2 |
| Other defined causes | 14.1 | 20.5 |
| Signs, symptoms, and ill-defined conditions (780–799) | 12.5 | 11.9 |

last category under study. In this respect, some studies carried out in the Federal Capital and in the province of Neuquén determined that a high percentage of women with institutional deliveries had attended only one prenatal consultation; such practices endanger the life of both mother and child.

Health of the Elderly

According to the 1980 national census, there were 2,300,000 persons 65 years old and older in the country. Of these, 97.2% lived in private homes and more than 64,000 lived in nursing homes, hospitals, and boarding houses. Of the total population, 27.8% lived in homes with unmet basic needs; this percentage is 20% for persons older than 65 years old, or approximately 454,000 people.

The homes with unmet basic needs constitute 22.6% of all private homes in the country. Of these, 12.4% are one-person households, while two or more persons live in 87.6%. Of persons living in one-person dwellings with unmet basic needs, 42.7% are over 65 years old, which indicates that about 85,000 elderly persons live alone and are poor. The geographical distribution of this phenomenon is uneven. In the province of Corrientes, 42% of the elderly live under these conditions; in Chaco, 44%; in Formosa, 46%; and in Santiago del Estero, 51%. However, in the province of Buenos Aires this figure is 17% and in the Federal Capital only 8%.

| Age group (years) | 1969–1970 | | 1982–1983 | | 1984 | | 1985 | |
|-------------------|-----------|---------|-----------|---------|----------|---------|----------|---------|
| | Men | Women | Men | Women | Men | Women | Men | Women |
| 1–4 | 314.6 | 301.9 | 144.4 | 124.4 | 135.5 | 122.5 | 103.0 | 94.5 |
| 5–14 | 81.4 | 58.5 | 49.1 | 35.5 | 48.1 | 34.5 | 43.7 | 30.2 |
| 15–24 | 172.0 | 107.4 | 114.8 | 64.4 | 114.2 | 64.1 | 115.4 | 56.5 |
| 25–34 | 260.6 | 164.3 | 168.9 | 107.7 | 169.8 | 107.7 | 147.6 | 97.1 |
| 35–44 | 499.1 | 277.4 | 379.3 | 22.1 | 365.2 | 218.5 | 321.3 | 202.0 |
| 45–54 | 1,117.0 | 531.7 | 929.6 | 443.7 | 967.5 | 455.5 | 849.6 | 415.6 |
| 55–64 | 2,535.0 | 1,185.5 | 2,119.9 | 981.1 | 2,056.9 | 944.4 | 1,894.3 | 907.2 |
| 65–74 | 5,370.0 | 2,950.7 | 4,162.5 | 2,314.6 | 4,378.3 | 2,352.7 | 4,039.6 | 2,171.0 |
| 75 and over | 12,293.5 | 9,508.3 | 12,003.2 | 9,538.0 | 11,686.4 | 9,391.0 | 10,902.2 | 8,996.3 |

Diseases of the heart are the leading cause of death in the age group 65 years old and older, and account for twice the number of deaths as the second leading cause. Malignant neoplasms, cerebrovascular diseases, arteriosclerosis, and pneumonia and influenza are the other leading causes of mortality in the elderly; no major differences by sex are observed. The morbidity profile of the elderly has been developed by the National Institute of Social Services for Retirees and Pensioners through the Program for Comprehensive Medical Care (PAMI). Its studies demonstrate that in the country's major cities, 45.8% of consultations with health services are for chronic afflictions and accidents. Disability consultations are distributed among deafness, malformations, paralysis, missing limbs, and other causes.

Chronic symptoms and conditions, measured in specific rates per 1,000 elderly persons, show a preponderance for problems of the circulatory system (458); arthritis, arthrosis, and rheumatism (389); digestive system problems (213); and nervousness, anguish, insomnia, and mental diseases (181).

Problems Affecting the General Population

Traditionally, Argentina has had great agricultural and livestock wealth, and it has been a leading exporter of beef and wheat. According to FAO, Argentina is one of the countries in which the dietary caloric intake remained constant from 1969–1971 to 1979–1981. The average supply of calories was 3,351 Cal daily in 1969–1971 and increased to 3,367 Cal in 1979–1981, as compared to the daily consumption of 2,250 recommended by FAO. In the 1978–1980 period, the per capita daily availability

of protein was 111.9 g, also considerably higher than the minimum requirement, and constituted primarily by proteins of animal origin.

According to the results of a study conducted by the Action Committee for Regional Food Safety (CASAR), Argentina's energy availability, expressed in kilocalories, diminished by 9% in 1984 as compared to 1979–1981. This refers to food availability or supply, without considering the possible food demand by the poorer sectors. The Ministry of Health and Social Action calculates that approximately 30% of children under 5 years old suffer from malnutrition, and, although somewhat high, this estimate probably applies to the rural areas of the northern provinces.

A comparative study carried out in 1982 among school-age children in two areas of Catamarca found that in the west 56% suffered from malnutrition in terms of weight-for-age, and 22% in terms of weight-for-height. In comparison, in the east the prevalence of malnutrition was 36% (weight-for-age) and 3% (weight-for-height). Another study of family units done in 1985 in Buenos Aires found that in a sample of 485 children under 2 years old, 17% of the males and 15% of the females were malnourished in terms of weight-for-age; 27% of the boys and 20% of the girls showed signs of chronic malnutrition (height-for-age). Regarding the nutritional status of schoolchildren, beginning in 1985 a study was carried out with 40,000 schoolchildren from all the provinces; 10% of the children were found to suffer growth retardation (chronic malnutrition).

The consistently high levels of agricultural and livestock production and the decline in real income of recent years suggest that malnutrition in Argentina is due mainly to poverty, rather than to food scarcity. The Government

operates three major nutrition programs: the national maternal and child health program, which encompasses the provincial programs for milk distribution to 40% of pregnant or lactating women and children under 5 years old; the program for school lunches, directed by the Secretariat of Social Action and targeted to economically depressed areas; and the National Food Program (PAN), established in the depressed urban and rural areas in 1984 to provide short-term and monthly emergency food supplements to low-income families.

Different regions of the country show 22% to 55% prevalence of iron deficiency anemia in children under 2 years old. Regarding iodine deficiency, there is an endemic area encompassing all the western provinces along the foothills of the Andes. Measures begun in the province of Mendoza in 1953 and expanded nationwide in 1967 have demonstrated that the best prophylaxis is iodized salt; in the course of 20 years, the prevalence of goiter diminished from 44% to 5%. However, in 1981 schoolchildren of the province of Salta were observed to have a prevalence greater than 30%. The same study on the consumption of iodized salt indicated that 14% of the families consumed noniodized salt; it is estimated that in the province of Salta alone, the population at risk of contracting goiter reaches 25,000.

There were 29 reported AIDS cases in 1985, 27 in 1986, 72 in 1987, and 174 in 1988. While serological studies do not make it possible to extrapolate the distribution of HIV in the overall population, they do show an increase among intravenous drug users and their sex partners.

The infectious diseases most frequently reported from 1985 to 1988 were diarrhea, influenza, and viral hepatitis. They were followed by gonorrhea, syphilis, and measles.

Of the major endemic parasitic diseases, Chagas' disease is the most commonly reported. Serological surveys done in segments of the population indicate that the speed of its transmission in the country is diminishing.

No malaria cases were registered along the borders with Brazil and Paraguay. The cases were concentrated along the northwestern border, and continue to be closely associated with migrants who work in crop harvests.

Leishmaniasis recurred in epidemic form in the northwest provinces; the causes are being investigated. A total of 228 cases were identified in 1985, 340 in 1986, 335 in 1987, and 165 in 1988. The cases of Argentine hemorrhagic fever reported for the same years were 402, 324, 535, and 339, respectively. Although there were no dengue outbreaks in the country during the quadrennium, in 1987 *Aedes aegypti* was detected in the provinces of Misiones and Formosa. Hydatidosis was identified in humans in all but one of the provinces; the last case of human rabies registered in the country occurred in 1985.

The most common natural disasters are floods; from 1985 to 1988, it is estimated that more than 200,000

persons were evacuated and 17 died as a result of floods. In 1985, in the province of Mendoza there was an earthquake that killed 6 persons, injured 100, and required the evacuation of almost 100,000. In 1988, the country was affected by an extensive and prolonged drought that harmed agricultural and livestock production; the impact on public health has not been evaluated.

Oral pathologies are very prevalent in Argentina, as eight of every ten children 12 years old have or have had dental caries. Only 35% of all persons under 18 years old have all their original teeth. By the age of 50 years, one in every five persons has lost all of their upper teeth. Oral cancer accounts for 5% of all cancers. Of children 6 to 14 years old, 86% have orthodontal anomalies: 17% need no treatment and 69% have malocclusions that require treatment.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

The country's health sector is complex and has never been integrated or coordinated by any reform or major reorganization. Health care is under the responsibility of the national Government, the 24 provincial governments, the municipalities, the social security hospitals, the Armed Forces, private hospitals, and independent physicians.

The health sector has three subsectors: public, social welfare, and private. The provinces and municipalities can organize and carry out health actions with considerable autonomy. The combination of these factors has resulted in a different health system for different population groups, depending on place of residence, occupation, and income. Each subsector has its own different organization and internal operation.

The public subsector provides services through three jurisdictions: national, provincial, and municipal. Until 1970, the public sector had the most effective technology, but this has changed since then. The public subsector covers users with lower incomes and who are not covered by any other sector; groups that are theoretically covered by the social welfare subsector but whose access is limited for economic reasons; and persons who live in geographical areas without organizations or with organizations that lack the required technical services. All this makes it difficult to quantify the population currently covered by this subsector.

The public sector infrastructure is extensive, but public hospitals have lost their leading role in terms of the three-fold function of providing care, teaching medicine, and undertaking research. This situation is reflected in several

important ways, such as limitations in the services' operating schedules; unsatisfactory health care; a shortage of drugs for patients who use outpatient services; a shortage of medical and surgical materials; low ratios of staff per bed and lack of training in provincial hospitals; poor maintenance of the facilities, which tend to be obsolete and deteriorated; and a type of hospital organization geared exclusively to the patient's hospitalization.

The social welfare subsector is made up of 337 entities, of which 292 (86.6%) are under the coordination of the National Institute of Social Welfare (INOS); the remaining 45 (13.3%) correspond to the social welfare services of the provinces, municipalities, the judicial branch, the Congress, and the Armed Forces and security forces. The subsector has a very limited infrastructure of its own and basically functions as a financing agency, since it contracts almost all the services it offers with the private subsector. It has many institutions, little organization, and internal inequity. This situation is due in large measure to the fact that social welfare services are structured by occupational group, and the occupational groups are, in turn, organized by branch of production in the national economy. The subsector has the following characteristics: each social welfare service designs the services it offers to its members, the provision of services varies from one social welfare to the next due to the different resources available to each, and the geographical dispersion of members means that workers belonging to the same occupational group and who make the same economic contribution receive different quality care, depending on where they live.

The private subsector is made up of two major groups: professionals who provide independent services to private patients affiliated with social welfare services or advance payment systems and health care establishments under contract to the social welfare service. This subsector also includes mutual aid and nonprofit institutions, such as the hospitals in ethnic communities. The private subsector has 31.4% of the beds in the country, and generates approximately 50% of all hospital discharges, especially those with short stays. It has 50% to 60% of the most sophisticated equipment, distributed in some 2,000 facilities of diverse levels of complexity, especially in the large cities (Buenos Aires, Córdoba, Rosario, and Mendoza).

Official data on coverage indicate that 74% of the population is covered by social security, while the remaining 26% depends on public or private services requiring direct payment. However, the 74% covered by social security includes duplications, and real coverage is closer to 65% for social security and 35% for the public services and the private sector. Of this percentage, only a minority (10%) can pay for effective coverage through private insurance or direct payment; this explains why an estimated

25% of the population that has no financial resources, seeks medical care from the public sector. The three branches of the Armed Forces, the security forces, the police, and the prison system, have their own social welfare services, which cover one million people through programs that exclusively benefit members.

In addition to the social security system, there are approximately 1,000 nonprofit mutual funds, similar to credit unions, which offer medical care plans financed by individual contributions. In urban centers, supplementary forms of insurance have expanded significantly (coinsurance, emergency plans, intensive care coverage, and others).

Although only 25% of the population has no financial coverage, the actual percentage covered by the public sector, in other words, the percentage served in establishments or offices other than those of the private and social welfare subsectors, may be greater for some activities. According to public-sector hospital statistics and with 75% of beds reporting from 1980 to 1987, discharges numbered 1.4 million; consultations, 40 million; and deliveries, more than 200,000. After correcting and expanding this last figure, an analysis shows that 35% to 40% of all deliveries are covered by these health services.

The Ministry of Health and Social Action is the country's principal authority in the areas of health, housing, and social programs. Within the Ministry, the Secretariat for Health is responsible for coordinating the sector. In 1984, the Ministry of Health and Social Action formulated the General Health Plan, whose principal guidelines are: to achieve equitable access to optimal health services; to ensure a broad-based popular participation, as well as the participation of the various sectors affected by the programming and implementation of activities; to overcome inequities and discrimination through a unit that would provide effective political leadership to guide activities conducted by the State, the social welfare subsector, and the private subsector; and to craft a National Health System that would coordinate the different services, ensuring the best possible use of resources.

In December 1988, the National Congress passed legislation on social welfare and the National Health Insurance system. Health as a universal right is the foundation of the National Health Insurance system, whose basic goal is to encourage all professionals and public, private, and social welfare establishments to work together with a comprehensive network of services available to all inhabitants nationwide. In addition to those who already are affiliated with the social welfare subsector, the National Health Insurance system will include self-employed workers and eventually those who lack health protection because they do not work for wages. The latter will be included through a joint financial effort by the national and provincial governments. The project strictly follows

the federal system, contemplating the progressive decentralization of the National Health Insurance system in the provinces.

In 1988, the project of federalization and decentralization of the health sector was implemented as a joint task of the Secretariat for Health and the provinces of Salta, Mendoza, San Juan, and Córdoba; subsequently, the provinces of Río Negro, Neuquén, Entre Ríos, and Santiago del Estero also participated in the project.

The General Health Plan includes programs for direction, regulation, and control; activities dealing with individuals and the environment; resource management; health support; and programs for emergency and national coverage. The Health Support Program encompasses activities for providing national assistance to the provincial health programs, and aims at the uniform development of the health sector within the country's federal structure. The General Health Plan includes other national coverage programs geared to improve the health conditions of the population. These include:

1) Primary health care. Primary health care has top priority in the health services' reorganization.

2) Rehabilitation of the health infrastructure. The proposed Program will help improve operations of the second-level hospitals by strengthening their operating capacity and improving the quality of care. It will be carried out primarily at the provincial level; currently, this program covers a total of 3,000 beds. It is directed to general hospitals that are seriously outdated physically and functionally (hospitals which date back an average of 82 years). The improvement of hospitals located in provincial capitals was considered essential, so they could serve as regulatory and reference centers, and thus supplementing the health services provided by the private sector.

3) The National Food Program (PAN). The results of the 1984 INDEC study on poverty, according to which basic needs were not met for 5.5 million people, provoked great concern. As an emergency measure, the Ministry of Health and Social Action prepared a food supplement program for 1.4 million families from this group who lived in depressed areas. The program involves monthly distribution of basic food packages such as sugar, oil, meat, and other essential items that would meet 30% of the needs of an average family of two adults and two children. PAN collects, transports, and distributes 1,000 tons of food daily and covers all the provinces; it targets the poorest areas of the northeast and the northwest, as well as the poverty areas surrounding Buenos Aires.

The program has broad political support. In 1986, its budget came to \$US206 million: 92% goes for food and the remaining 8% covers personnel, storage, and transportation costs. PAN is linked to other efforts, such as the community vegetable gardens, sanitation works, and maternal and child health activities. It also is part of the

community-level social and health programs, and has the potential to play a major role in extending primary health care.

4) The Drug Assistance Fund (FAM). The 1984 study on the population with unmet basic needs demonstrated that many inhabitants—including the vast majority of that 24% of the population not covered by social security—could not afford essential drugs. To address this problem, the Congress promulgated a law, as a two-year renewable emergency measure, for providing basic drugs free of charge to families with unmet basic needs. The financial resources for this program come from taxes on pharmaceuticals and tobacco. A national list of drugs, the National Therapeutic Formulary, contains 300 essential drugs and a core group of 79 basic drugs.

5) Mental health. This category includes mental diseases, alcoholism, drug addiction, mental and sensory deficiencies, and social rehabilitation. Currently, there are 24,000 psychiatric beds in both public and private sector institutions. Most of the public psychiatric hospitals were built around 1910, and they have deteriorated and are totally inadequate. The private hospitals have some 2,000 beds, and their quality of care varies.

In 1984, the Ministry of Health began a campaign to encourage the provinces to reorganize psychiatric services by emphasizing prevention, early diagnosis, referral to specialists, outpatient treatment, short-term hospitalization if necessary, and social rehabilitation. The Ministry's program contemplates a reduction in the number of beds for psychiatric patients, the conversion of some hospitals into halfway houses, and the establishment of mental health centers and day-care centers. Given that the program drastically reduces costs, it has won broad support.

6) Laboratory services. There are more than 100 public health laboratories in provincial and municipal research centers, at universities, and in other public institutions that work to control diseases in man and animals, water quality, sewerage systems, and environmental pollution. There also are more than 1,000 laboratories in private chemical and agroindustrial institutions for the preparation of food and beverages, and another 10,000 clinical laboratories in hospitals, health centers, medical offices, and pharmacies. The nation's laboratories are not organized by levels of complexity, nor do they receive support from regional referral laboratories. The lack of standards and calibration hinders the application of quality controls to the laboratory tests.

7) Food and Drug Administration. Imported drugs and intermediate products are not subject to quality control, and neither are pharmaceutical plants, warehouses, or pharmacies involved in retail sales. This does not encourage the serious manufacturers and discourages investment and curtails exports. The absence of a competent agency that can carry out evaluations, reject drugs, serve

as arbiter in disputes, and protect patents poses problems both within and outside the country. Finally, the lack of scientific and technological support seriously limits the industry, especially those small firms that operate high-technology companies.

The situation is similar for the control of food products. There are approximately 300,000 registered food products. In addition to thousands of local domestic industries, 280 industrial plants produce dairy, meat, and fish products, as well as canned and frozen foods. None of these plants have any quality control.

With industry support, the Government has proposed effective quality controls for food and drugs. This effort requires strengthening 26 interrelated provincial institutes, university departments, and research centers nationwide, within the framework of a national policy on science and technology.

Installed Capacity

The primary care network is made up of 6,456 health establishments without hospitalization facilities which carry out activities to promote health and prevent and treat diseases on an outpatient basis. Of these, 30% are located in the Federal Capital and in the province of Buenos Aires. In the different provinces, these establishments are variously called health centers or peripheral clinics, among others. In the private subsector, most of these establishments offer diagnostic services (clinical laboratories, radiodiagnostic offices, etc.). In general, the current infrastructure for outpatient care provides a good basis for expanding primary care.

The capacity of hospitals and public health centers to serve outpatients is insufficient. In contrast, the private sector has a surplus in this area: polyclinics frequently have an excess of equipment, especially costly advanced technology. Other types of outpatient care—such as day-care centers and home care for chronic and elderly patients—have a very limited scope.

The country has 3,180 hospitals and 147,000 beds, for an average of 5 beds per 1,000 population. Of the total number of beds, 68% come under the public sector, the social security system, and the Armed Forces, while the remaining 32% are in private sector institutions (Table 12).

Over the last 20 years, the federal Government has transferred some 200 hospitals to the provinces, retaining only the country's extended-stay hospitals that provide care in specialty areas such as psychiatry, burn treatment, ophthalmology, leprosy, and major disabilities. Provincial hospitals constitute the cornerstone of the public health system; they care for most of the patients admitted to hospitals, especially in the poorer provinces where the

social welfare system is still limited. In the cities of Buenos Aires, Córdoba, Rosario, and Santa Fe, the provincial system is supplemented by municipal hospitals.

The Armed Forces (army, navy, air force) and police hospitals provide services only to the one million persons who are personnel, family members, retirees, and pensioners. With 9.8 beds per 1,000 population, these institutions constitute a significant reserve in hospital capacity.

The private hospital sector is a conglomerate of institutions and establishments that vary greatly in their objectives and functions within the system. They can be classified in three groups: a) nonprofit hospitals, frequently called community hospitals, some of which have signed contracts with the social welfare system and with companies that offer medical insurance; b) small for-profit hospitals (with fewer than 40 beds), which account for 47% of all beds in private clinics and usually belong to a group of physicians who administer them; and c) large for-profit hospitals, with up to 1,000 beds, which are administered as commercial undertakings, and have many contracts with the social welfare services and other institutions.

Table 13 presents data on the public subsector; it does not include establishments for chronic patient care nor public subsector establishments dependent on other areas (Armed Forces and security forces, the university, and others). The table also does not reflect medical consultations carried out in establishments that do not provide hospitalization (health centers, polyclinics, etc.). The various indicators shown are averages of the annual values for 1984, 1985, 1986, and 1987. These indicators have not been corrected for place of residence; consequently, since much of the Greater Buenos Aires' population is served in the Federal Capital, the values obtained are higher than the real figure for the Federal Capital and lower for the province of Buenos Aires. This requires particular caution in the use of the following indicators: discharges per 100 inhabitants, medical consultations per inhabitant, deliveries in public establishments as a percentage of live births in the province, and pediatric and obstetrical discharges as a percentage of total discharges.

Despite the fact that the calculation was made in terms of the total population of each province, the public hospitals have a great weight in the indicator discharges per 100 inhabitants; in almost all the jurisdictions the value is higher than 5 (the largest value is for Jujuy, with 9.6 discharges per 100 inhabitants). With the exception of Tucumán, the lower values were in the most developed provinces (Federal Capital, Buenos Aires, Córdoba, and Santa Fe); in other words, output is greater in the less developed provinces.

In the vast majority of the provinces, activities in maternal and child health (pediatric and obstetrical dis-

| Subsector | Hospitals | Beds | | | |
|--------------------|-----------|------------|-----------|---------|-------|
| | | Short stay | Long stay | Total | |
| | | | | No. | % |
| Public | | | | | |
| Ministry of Health | 24 | 2,301 | 8,279 | 10,580 | 7.2 |
| Provinces | 873 | 43,378 | 13,698 | 57,076 | 38.8 |
| Municipalities | 220 | 13,254 | 1,162 | 14,416 | 9.8 |
| Social security | 114 | 7,590 | 489 | 8,079 | 5.5 |
| Armed Forces | 211 | 8,928 | 883 | 9,811 | 6.7 |
| Private | 1,738 | 42,237 | 4,811 | 47,048 | 32.0 |
| Total | 3,180 | 117,688 | 29,322 | 147,010 | 100.0 |

Source: Ministry of Health and Social Action, 1986.

| Jurisdiction | Discharges per 100 population | Medical consultations per person | Deliveries/discharges (%) | Obstetric consultations per delivery | Deliveries/live births ^a (%) | Pediatric and obstetric discharges ^b (%) | Pediatric consultations (%) | Occupation ^c (%) | Average length of stay (days) |
|---------------------|-------------------------------|----------------------------------|---------------------------|--------------------------------------|---|---|-----------------------------|-----------------------------|-------------------------------|
| Federal Capital | 4.9 | 1.8 | 16.5 | 8.3 | 50.7 | 59.9 | 22.3 | 25.3 | 11.9 |
| Buenos Aires | 3.6 | 1.1 | 19.1 | 5.4 | 36.9 | 31.0 | 37.2 | 21.5 | 14.7 |
| Catamarca | 7.1 | 1.2 | 18.9 | 2.9 | 58.0 | 50.1 | 51.4 | 45.7 | 12.0 |
| Córdoba | 3.6 | 1.3 | 16.9 | 9.4 | 33.7 | 35.5 | 45.7 | 21.2 | 24.0 |
| Corrientes | 6.8 | 1.4 | 23.2 | 5.5 | 50.9 | 40.0 | 51.0 | 61.2 | 9.8 |
| Chaco | 6.8 | 1.8 | 25.8 | 5.5 | 68.9 | 47.4 | 58.7 | 52.0 | 7.2 |
| Chubut | 6.8 | 1.5 | 17.0 | 9.2 | 43.6 | 51.7 | 32.0 | 59.1 | 9.4 |
| Entre Ríos | 6.9 | 1.2 | 14.7 | 6.1 | 42.7 | 37.8 | 22.7 | 53.5 | 13.7 |
| Formosa | 8.2 | 1.5 | 20.6 | 3.8 | 50.8 | 54.3 | 49.2 | 54.9 | 6.0 |
| Jujuy | 9.6 | 2.2 | 19.3 | 8.2 | 61.5 | 52.5 | 25.8 | 60.4 | 9.3 |
| La Pampa | 5.8 | 1.8 | 18.2 | 8.1 | 45.5 | 37.3 | 13.1 | 44.4 | 10.7 |
| La Rioja | 6.5 | 1.5 | 23.5 | 5.0 | 56.2 | 47.2 | 44.8 | 33.8 | 6.9 |
| Mendoza | 5.5 | 1.5 | 21.0 | 4.2 | 49.4 | 500.7 | 48.5 | 21.3 | 11.1 |
| Misiones | 6.5 | 1.2 | 27.1 | 5.1 | 50.2 | 41.6 | 49.9 | 69.4 | 8.1 |
| Neuquén | 8.7 | 3.0 | 22.9 | 8.3 | 68.0 | 47.8 | 47.1 | 61.8 | 7.2 |
| Río Negro | 6.0 | 1.5 | 20.6 | 7.0 | 47.3 | 48.4 | 33.9 | 58.2 | 8.6 |
| Salta | 9.1 | 2.7 | 19.1 | 3.6 | 54.3 | 49.9 | 40.3 | 58.8 | 9.3 |
| San Juan | 6.1 | 1.6 | 20.7 | 5.3 | 52.7 | 44.9 | 51.5 | 63.0 | 8.4 |
| San Luis | 5.9 | 1.2 | 19.9 | 3.5 | 49.0 | 49.4 | 43.6 | 43.2 | 9.1 |
| Santa Cruz | 5.7 | 1.2 | 19.3 | 5.4 | 37.3 | 41.7 | 36.5 | 47.9 | 9.6 |
| Santa Fe | 3.5 | 1.0 | 12.2 | 7.1 | 23.4 | 33.0 | 14.0 | 62.9 | 13.7 |
| Santiago del Estero | 6.1 | 0.8 | 25.1 | 2.5 | 57.6 | 45.8 | 47.2 | 55.3 | 8.1 |
| Tucumán | 4.2 | 1.2 | 28.1 | 1.6 | 50.3 | 46.6 | 31.5 | 57.0 | 11.0 |

^aThe denominator is the number of live births in the corresponding jurisdiction.

^bPercentage of pediatric and obstetric discharges over total discharges.

^cPercentage of pediatric consultations over total consultations in establishments with hospitalization.

charges) account for more than 40% of all discharges. The importance of the mother-child pair is also observed in pediatric consultations as a percentage of total consultations and in the ratio of obstetrical consultations to deliveries attended to, although delivery care fluctuates widely. It is possible that many obstetrical consultations are carried out in establishments that do not offer hospitalization, but that information is not available. Despite this, the importance of outpatient consultations in establishments that offer hospitalization is observed in the indicator medical consultations per inhabitant: with the exception of Santiago del Estero, this figure is always greater than 1, rising to a maximum value of 3 in Neuquén.

The overall figure for deliveries attended to in public hospitals as a percentage of total live births in the provinces is 40% for the Federal Capital and Buenos Aires together; with the exception of Santa Cruz, Santa Fe, and Córdoba, all the provinces have values over 40%, with the maximum value being 68.9% in El Chaco. Deliveries expressed as a percentage of total discharges fluctuate around 20%, with a minimum of 12.2% in Santa Fe and a maximum of 28.1% in Tucumán.

Bed turnover by jurisdiction presents marked differences. This figure is influenced by factors such as geographical distribution, concentration or dispersion of the population, access to health care services, and the types of patients. There are six jurisdictions with occupancy rates between 60% and 70%, eight with values ranging from 50% to 60%, and nine with values under 50%. The average length of stay per discharge is also highly variable (ranging from 24.0 days in Córdoba to 6.0 in Formosa), with an overall value of approximately 12 days per discharge.

All of the above indicate the priority and high real coverage of the maternal and child area, as well as the structural inefficiency (idle capacity in terms of beds and long average length of stay). This reflects the physical obsolescence and lack of resources for effectively addressing diseases that have arisen as the country's morbidity profile has changed.

Health Services Technologies

The country produces and consumes biologicals (vaccines, sera, blood and blood derivatives, multiple antigens, and reagents) for animal and human use. Until the mid-1960s, the country was almost self-reliant for both production and quality control of biologicals, which were exported to other Latin American countries. Currently, national production meets only 25% of the needs. The production of immune sera and substitutive hormones of animal origin has declined due to the obsolescence of the technology and insufficient scientific support.

When there are outbreaks of viral epidemics such as hepatitis B and AIDS, the Carlos Malbrán National Institute for Microbiology cannot meet the country's needs.

Consumption of drugs was estimated at \$US38 per inhabitant in 1985. Expenditures for pharmaceutical products come to 1.7% of the GDP. There are 13,400 registered drugs, 1,500 of which are found in the market under 3,400 names and in 7,000 forms.

There are 351 manufacturers of registered drugs. Some 50 large companies, mostly multinational or foreign, along with a dozen national firms, produce 90% of all drugs. Each of the remaining smaller firms manufactures only a few products, usually with imported raw materials. Potentially, the country could produce all the necessary pharmaceutical products, since the limitations are more economic than technological. Approximately 75% of the raw material and intermediate substances are imported.

Drugs are distributed through three principal means: the network of wholesale outlets, cooperatives, and 23,000 pharmacies, which together account for 89.6% of total sales; direct sales to public (5.1%) and private (5.3%) hospitals; and through the Drug Assistance Fund.

The "technological factor" leads to an accelerated and unpredictable increase in medical care costs, along with a growing ineffectiveness of the State's mechanisms for controlling the appropriateness and quality of imported and nationally manufactured devices. For example, just over ten years ago, the country began to operate its first CAT scanner; by late 1988, 132 units were in operation, most of them in the Federal Capital. There has been a disproportionate concentration of modern equipment in the private sector of the metropolitan area.

Imports of medical devices have increased, not only for highly sophisticated equipment but also for disposable inputs and materials. In 1986, import orders totaled approximately \$US64 million. This figure quadrupled in 1987, with orders coming to \$US248 million. These values are already comparable to the total for traditional imports of drugs and biologicals, which increased from \$US250 million to \$US280 million in the three-year period. In 1988, the National Program for Medical Technology was established to develop the country's capability to evaluate the effectiveness of and risks inherent in the use of devices and technological practices, to measure their quality and social impact, and to collaborate in regulating imports and technological transfer.

Financing of Health Services

In 1985, health expenditures were equivalent to approximately 8.2% of the GDP, or about \$US190 per capita. Although total expenditure in health increased as a proportion of the GDP from 1970 to 1985, since the per capita GDP diminished in that period, total per capita

expenditure in health was less in 1985 than in 1970, even though it had increased since 1980.

In 1985, health expenditures that derived from budgetary allocations from the public sector were equivalent to 22.7% of the total; funds from the social security system came to 39.2%; and private expenditure accounted for the remaining 38.1% (Table 14). The percentage participation of the social welfare component increased steadily (22.8% in 1970, 35.8% in 1980, and 39.2% in 1985). In contrast, while the public sector percentage grew from 1970 to 1980, it diminished sharply thereafter.

The public subsector has undergone changes in the jurisdictional distribution of budgetary implementation. In 1970, the national administrative level accounted for 48.7% of public spending, and the provincial level, 51.3%. In 1986, the national share dropped to 27.8%, while the provincial share increased to 72.2%.

Regarding private expenditure, for the metropolitan area of Buenos Aires (35% of the national population) expenditure on health as a percentage of total spending for the family basket jumped from 1.5% in 1960 to 4.4% in 1970, and then to 7.9% in 1985. In other words, this proportion has quadrupled in 25 years.

This points to a decreasing role of the national public sector in total health expenditures, which increasingly take place in the provincial jurisdictions, and to a recovery of private expenditure, which is at the same level as the social welfare funds and is currently proportionately greater in relation to total expenditure on consumer goods. Together, the social welfare and private subsystems financed 80% of total health expenditures.

The private sector's annual supply of services and inputs has increased by 5,000 physicians and 350 drugs, while the number of private beds has expanded 4.2%. This growth is based largely on a sizable base of available resources (approximately 90,000 physicians, some 47,000 beds, and high per capita consumption of drugs, which approaches \$US50).

The significance of these facts is manifold. First, the public sector, which serves the lower-income sectors of the population, is weakened. Second, the greater private expenditure could be masking situations such as the distancing of the population from a deteriorated public sec-

tor, the compensation from the lack of financing for the social welfare services, and a greater payment capacity in those sectors that were able to defend and even increase their incomes during the crisis. And third, the social welfare services' increased relative participation in expenditure reflects the impact of the legal provisions that have increased the percentages of compulsory discounts over time.

Human Resources

In 1980, the health sector employed some 290,000 persons (approximately 2.9% of the national work force), 210,000 of whom worked in health care facilities (excluding individual offices, analysis laboratories, and small practices). Estimates for 1985 suggest that the work force numbers 400,000 (4% of the economically active population). This trend reveals, on the one hand, the importance of the traditional practice of medicine, and, on the other, the growing importance of the health sector as a generator of employment and fiscal appropriations (4% of the economically active population; 8% of the GDP). This work force can be described as an inverted pyramid with more professionals than technicians and auxiliaries (Table 15).

In 1986 there were more than 90,000 physicians, for a ratio of one physician for every 335 people (29.8 per 10,000 population). In 1958, 1969, and 1980, the estimates of total physicians were 24,000, 54,000, and 69,000, respectively.

Physicians are unevenly distributed between the capital and the provinces and between rich and poor provinces. According to the 1980 census, Buenos Aires had 47 physicians per 10,000 population; ten provinces had between 15 and 20 physicians per 10,000 population; another ten had between 10 and 14.9 per 10,000; and, finally, four northeastern provinces had fewer than 10.

Independent physicians serve patients affiliated with social welfare services or advanced payment medical service organizations and patients in higher income brackets. It is estimated that most of the country's physicians (approximately 50,000) work at least part-time in private consultations. Unemployment among physicians is practically nonexistent. The large number of physicians has not affected professional fees, largely because these fees are set by a rate schedule that is negotiated at regular intervals among the social security authorities, professional associations, and private health care providers. From 1960 to 1985, physicians' fees varied according to the consumer price index, and generally remained slightly above it.

Nursing is the most critical area in health manpower in Argentina, not only because of the shortage, but also

TABLE 14

Percentage distribution of health expenditure by subsector, Argentina, 1970, 1980, and 1985.

| Year | Public | Social works | Private |
|------|--------|--------------|---------|
| 1970 | 19.5 | 22.8 | 57.7 |
| 1980 | 30.1 | 35.8 | 34.1 |
| 1985 | 22.7 | 39.2 | 38.1 |

TABLE 15

Estimates of human resources in health,
Argentina, 1985.

| Profession | Number |
|--|--------|
| Physicians | 90,000 |
| Dentists | 22,000 |
| Pharmacists | 29,000 |
| Biochemists | 9,500 |
| Midwives | 4,000 |
| Physical therapists | 13,000 |
| Psychologists | 25,000 |
| Nurses | 16,000 |
| Nursing auxiliaries | 25,000 |
| Technical personnel | 90,000 |
| General administrative and service staff | 95,000 |

Sources: Register of human resources. Secretariat for Health, 1980. World Bank estimates, Argentina, 1988.

because the growth of this professional category appears to have stagnated. Notwithstanding this perception, there is no study detailing the situation or its trends. Currently, the country has registered nurses; nurses (with vocational training in universities or tertiary-level schools); nursing auxiliaries (with a post-primary course of 9 to 12 months); nursing personnel without formal training, such as practical nurses and auxiliaries; and nurse aides.

The structure of nursing personnel shows a predominance of practical nurse auxiliaries and aides; it is estimated that in 1988 these categories accounted for 73% of the total (Table 16). Most of the nursing personnel are women (83% in the 1980 census), even though they represent only 3% of the female work force. The modal age of nurses is over 30 years old, whereas the modal age of the labor force is under 25 years old. More than 90% of nursing positions are wage-earning posts, and most are in the public sector.

There is an inverted nurse-physician ratio (0.19 nurses per physician), and this inversion is maintained even when the 22,000 or so nursing auxiliaries are included. There are 5.7 nurses per 10,000 population. There are signs of stagnation in the nursing profession's growth: there were 40,225 positions in 1969, 64,691 in 1979, and 64,309 in 1988.

Traditionally, the work of nurses has been underestimated. In fact, the expansion of the health services network basically was carried out with auxiliaries and by allowing personnel with no formal training to enter the field. These personnel account for 39% of total nursing personnel nationwide; in some institutions this figure is as high as 80%.

Any discussion about health sciences training must consider the problem of the large numbers of students that most medical schools face. In 1986, medical students (53,991) constituted 7.6% of all university students, as compared with approximately 9.0% in 1976 (56,747 students). There are nine medical schools in the country; from 1979 to 1984 there were an average 5,000 graduates per year. Despite the lack of data needed for projections, it is estimated that since 1980 some 25,000 physicians have joined the labor market, and that in the next five years another 15,000 will enter the field.

The outlook for training in nursing is quite different, as reflected by the serious lack of students. Fewer than 400 nurses have completed the necessary university studies for obtaining a registered nurse degree. The remaining 17,000 nurses have received vocational training in 18 university-level schools and 48 tertiary-level schools (27 public and 21 private), with an annual average of 300 graduating nurses and a high drop-out rate. Approximately 1,000 auxiliaries graduate each year.

Little social prestige, low wages, and the training level associated with nursing make hiring very difficult and prevent raising employment requirements. There is a consensus among service providers and nursing associations that the nursing shortage must be solved and that nursing training must be improved, even though in the short term the absorption capacity is limited and the tasks of physicians, technical personnel, and nursing personnel must be redistributed.

Training in dentistry has grown slightly in recent years. In 1986, 5,759 students were enrolled in the seven university schools; it is estimated that since then, 1,000 dentists have graduated annually.

Enrollment in psychology study programs is growing rapidly. The psychology curriculum has oriented professionals almost exclusively toward clinical training (predominantly psychoanalytical) and toward private practice. In 1986, 8,033 students were enrolled in the psychology program at the University of Buenos Aires, and they accounted for 3.7% of total students. In 1988, there were 10,000 students registered in psychology programs, accounting for 5.4% of the total.

At present, residencies are the most important means of achieving a medical specialty; there were 6,000 in 1985. Information for 1988 from some provinces indicates that there are 1,741 residents in the province of Buenos Aires, 243 in the city of Rosario, 600 in the province of Córdoba, 28 in Río Negro, and 1,844 in the municipality of the city of Buenos Aires. The university does not grant a specialist title; in some provinces this is done by the professional schools. In most provinces, professionals who work as specialists lack adequate technical training.

In some cases medical residencies are done under the aegis of the university, coexisting with nonuniversity res-

TABLE 16

Estimates of nursing personnel, by type and by subsector, Argentina, 1988.

| Subsector | Registered nurses | Nurses | Nursing auxiliaries | Self-trained nurses | Total |
|----------------|-------------------|---------|---------------------|---------------------|----------------|
| Public | 226 | 10,276 | 14,667 | 16,852 | 42,021 (65.3%) |
| Social welfare | 55 | 2,093 | 1,590 | 1,014 | 4,752 (7.4%) |
| Private | 102 | 4,749 | 5,563 | 7,122 | 17,536 (27.3%) |
| Total | 383 | 17,118 | 21,820 | 24,988 | 64,309 |
| | (0.5%) | (26.6%) | (33.9%) | (38.8%) | (100.0%) |

Source: Estimates from the National Division of Human Resources, 1989.

idences that have different requirement levels and that are neither monitored nor accredited. The number of residences is small when compared to the number of graduates. Even so, in recent years it was difficult to fill the available residencies. There is no national policy on medical residencies or specialties, nor any orientation that focuses on areas in which professionals are most needed.

Training in public health and health administration is carried out through a broad range of institutions and without significant coordination. A variety of institutions such as medical schools, schools of public health, upper-level schools of health, professional schools, national institutes of epidemiology, hospitals, scientific associations, and others have offered nearly 90 courses of more than 300 hours duration in the last four years, with an average of 40 participants per course.

In 1986, a study was conducted in a large public hospital that is representative of conditions in the sector. It showed averages of 1.27 beds, 6.3 daily consultations, and 23.3 discharges per physician per year. The hospital services have a surplus of personnel, as reflected in the national average of 2.06 hospital beds per physician. In addition, trends in the supply of personnel did not differ in any major way between the public and private sectors.

The process of federalization and decentralization that is being promoted by the Ministry of Health, by eight provinces through their Ministries and Secretariats for Health, and by PAHO emphasizes certain personnel problems. Over the last two years, many provinces have promulgated laws and regulations in order to have legislation for redirecting and improving human resources development. These laws establish the accreditation of qualified job performance through training as a basic criterion, a provision that has led to the organization of programs and systems for personnel training. The traditional separation between health services and university programs is one of the obstacles to be overcome before human resource development serves the needs of the population and the requirements that result from changes in the services.

HEALTH AND THE ENVIRONMENT

In 1984, the Secretariat for Water Resources, which coordinates all the agencies in this sector, including the National Bureau of Environmental Quality under the Ministry of Health and Social Action, conducted an assessment that showed a serious lack of health services coverage for urban and rural areas. The assessment also highlighted the vagueness in the efforts to develop a policy that would bring about the medium-term transformation of the 24 agencies in charge of providing urban water services at the provincial level and the water services to population centers with 500 to 1,500 inhabitants, as well as of the National Bureau of Environmental Quality itself, which is responsible for providing water and building latrines in rural areas for the scattered rural population.

In 1985, the Argentine Association of Sanitary Engineering and Environmental Sciences presented an assessment of the services and proposed solutions. The authorities, especially the Secretariat for Water Resources, considered the recommendations. The Secretariat, together with the World Bank, carried out a second assessment, which in 1988 led to a bill that created the Federal Commission on Drinking Water and Sanitation. The Commission brings together all the institutions of the sector and broadens the functions of the National Drinking Water and Rural Sanitation Service by establishing an agency to plan, monitor, and coordinate plans and programs with national and international funds. At the same time, it is studying and discussing a National Sanitation Plan that outlines the policy and strategies for addressing the sanitation problem.

These decisions have opened a broad field in the area of financial management, institutional development, technological improvement, and social and technological activities (measurement of the water, social rates, etc.) to improve and more rapidly extend coverage of sanitary services to the entire population.

The programs for treatment and disposal of solid

wastes are all under the responsibility of the municipalities. The national and provincial Ministries of Health cooperate in the training of personnel through a specialized course given at the University of Buenos Aires that is geared to technical personnel in charge of developing urban companies, and through courses in different parts of the country for municipal technical personnel responsible for these services. This program has been persistently carried out, and services have improved nationwide. The Secretariat for Housing and Environmental Management, under the Ministry of Health and Social Action, studies possible improvements to and expansion of the municipal waste disposal services.

The National Bureau of Environmental Quality and the provincial and municipal agencies have jointly developed and simplified the system for assessing environmental pollution in many cities, facilitating the establishment of programs with clearly defined priorities.

The problem of toxic substances has led to the creation of a multi-institutional committee that sets standards and carries out actions in this field. In addition, studies are being carried out by the National Institute for Water Science and Technology on pollution of the surface waters of the Negro River and by the National Bureau of Environmental Quality on the presence of and dangers posed by nitrates in groundwater in several parts of the country. The Bureau has established a register of dan-

gerous substances (it has listed over 2,300 such substances). Also, in coordination with other agencies, it is setting up a network for emergency control. Different provinces have held courses for technical personnel who work with pesticides; currently, a manual is being distributed for rural workers.

The construction and planning of large-scale, multiple-use hydric works (Itaipú, Yaciretá Apipé, Uruguái, Middle Paraná, Salto Grande, and others) have led to environmental impact analyses and to the search for ways of optimizing the positive aspects and offsetting the negative ones. The Secretariat for Energy developed and analyzed evaluation methods. In addition, the universities of Buenos Aires, Misiones, Córdoba, and Neuquén offered courses to disseminate the information, and these courses will be repeated in Morón and Tucumán. The courses consider the impact of the various works in order to address the types of problems that may arise from future public works construction.

The program for surveillance of water quality continues, including the Global System for Environmental and Water Surveillance. Also, programs to control air quality in at least eight Argentine cities have continued.

The program for the control of ionizing and nonionizing radiation, which includes their use in measurement operations, continues expanding its coverage with ever-greater success.

BAHAMAS

GENERAL CONTEXT

Political, Economic, and Social Situation

The Commonwealth of the Bahamas has been an independent unitary state within the Commonwealth of Nations since July 1973. It is governed as a parliamentary democracy based on the Westminster/Whitehall system of government, with a Parliament comprising a Governor General, the Queen's representative; 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. The Government has remained stable since 1967.

Government programs are carried out by ministries, each headed by a Minister (political) and a Permanent Secretary (administrative), as well as through quasigovernmental institutions.

Provisional estimates for 1986 place the gross domestic product (GDP) at \$US2,213.1 million, with a corresponding per capita GDP of \$US9,377.5. Tourism and tourist-related activities remain by far the largest economic activity, with more than three million tourists visiting the Bahamas in 1988, and account for about three-quarters of the GDP. Service industries, including government service, banking and insurance, fishing, and agriculture, employ approximately 80% of the eligible labor force.

Current public policies of diversification and self-sufficiency have led to a renewed interest in agricultural activities as well as the continued growth of an industrial sector, the latter including oil refinery, pharmaceutical manufacturing, and a significantly increased number of light industries.

The proportion of government resources allocated for servicing the health care system is second only to that invested in education. The amount allocated to health has increased from \$US22.6 million in 1977 to just over \$US68 million in 1987. This represents 18.4% of the total government budget and, in 1986, an expenditure of approximately 3.1% of the GNP. The Government is currently considering, as an alternative method of health financing, a national health insurance scheme.

The education system is comprised of public and pri-

vate schools, with an enrollment in 1986 of 36,003 in primary, 23,280 in secondary, 276 in special schools, and 4,932 in the College of the Bahamas.

The 1986 Labor Force Survey estimated the active labor force (110,900) at 71.4% and unemployment at 12.2%, with rates of 9.7% for males and 15.0% for females. That survey estimated the mean annual income per household for all the Bahamas at \$16,656; for New Providence at \$17,960; and for Grand Bahama at \$17,845.

Demographic Characteristics

In 1987, the estimated midyear population was 236,000, and the current population projection for the year 2010 is 325,000.

In 1980, for every 100 persons in the active population (15-64-year-olds), there were approximately 67 young persons, which represents a youth dependency ratio of 66.8%. The total dependency ratio, which includes the aged, is estimated at 74.1%. The sex ratio in that same year was 95 males to 100 females.

Knowledge of the distribution of the population by island location is currently based on the last census results, which show that 80.4% of the population live on the two islands of New Providence and Grand Bahama, which contain the cities of Nassau and Freeport, respectively.

Although the population is predominantly a young one with its attendant health and social policy requirements, it is projected that the percentage of elderly (65 years and over), now representing 4.5% of the population, will increase to 5.9% by the year 2010. This will have implications for public policy in regard to the health of the elderly and other social considerations.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Morbidity and Mortality

Official statistics based on birth registrations show that the crude birth rate, which was relatively consistent from

1979 to 1985, dropped by more than 16% in 1986 to 20.2 births per 1,000 population. Preliminary figures from this source imply a further significant decline (11%) in 1987.

Estimates of actual occurrences of these events, however, suggest that a sharp increase in the underregistration of births in 1986 and 1987 is likely to have accounted for a significant portion of the decreases seen in the birth rate. Nevertheless, alternative indicators suggest that the nation's live-birth rate had declined in 1986 and 1987, although not as sharply as indicated under the civil registration system.

The Department of Statistics, which is responsible for vital statistics, has noted that one of the basic factors affecting the registration of births arises from the administrative difficulties in the scattered communities of the Family Islands.

The leading causes of death for the entire population continue to be malignant neoplasms, diseases of the heart, accidents and violence, and cerebrovascular diseases. It is significant that conditions originating in the perinatal period rank fifth as a cause of death in the general population, and point to the need for urgent attention to be given to mitigating this phenomenon. Between the ages 1-44 years, accidents and violence are the leading cause of death.

Analysis of the number of deaths and death rates by age group and sex shows that, with the exception of the very elderly (persons 75 years or older), in every age group the number of males dying outweighs the number of females, with the highest male to female ratio occurring in the age groups 10-14 years (sex ratio of 3.0:1) and 20-34 years (sex ratio of 2.8:1).

The reduction of accidents and violence has been targeted for special focus, and research and intervention activities are being set by a national committee for the prevention of trauma, established in March 1988. In addition, many of the diseases which are related to lifestyle patterns are being addressed through ongoing health promotion and disease prevention public campaigns.

Incomplete coverage is generally of much less concern under the death registration system than under the birth registration system. There are, however, concerns about the documentation and coding of cause of death for the medical certification of these events.

Health Situation of Specific Population Groups

Child Health

In 1986, the infant mortality rate peaked at 36.7 per 1,000 live births, the perinatal mortality rate was 33.5 deaths per 1,000 live births, and the neonatal mortality

rate was 24.3. Irrespective of adjustments for underregistration of births, the statistics for that year persistently allude to a need for increasing interventions to reduce the problem of mortality in children under 1 year of age. Under these adjustments, infant mortality is more validly placed at 30.2 per 1,000 live births and perinatal and neonatal mortality rates per 1,000 live births at 27.6 and 20.0, respectively. Yet, it cannot be ignored that previous years have shown rates for the Bahamas that fell in the low twenties.

The five leading causes of death among children under 1 year of age in 1986 accounted for 86% of all deaths among infants. The main causes of death and the corresponding death rates per 1,000 live births are: conditions originating in the perinatal period (13.4); congenital anomalies (2.6); pneumonia, bronchitis, and other respiratory diseases (2.2); intestinal infections (1.6); and accidents (1.3).

Children aged 1-4 years had a mortality rate of 1.3 per 1,000 population in 1986, with accidents and injuries causing most deaths in this group. In 1987, 11 children died as a result of this problem, representing 37% of all deaths among 1-4-year-olds.

Among all children under 15 years old, the death rate was about 2.5 per 1,000. Infants represented 75% of the deaths in this group. The most frequently occurring cause of death for children 5-14 years old is transport accidents (56% of all deaths in 5-14-year-olds); other accidents and injuries account for an additional 15% and 30% of the deaths among 5-14-year-olds and 1-4-year-olds, respectively.

Gastroenteritis continues to be one of the most prevalent conditions affecting young children. The number of reported cases in under 5-year-olds peaked at 1,486 in 1987 but, encouragingly, dropped again to an all-time low of 1,095 in 1988.

Activities under the Expanded Program of Immunization have resulted in a marked reduction of childhood morbidity and mortality from diseases preventable by immunizations. Except for an outbreak of mumps in 1985 (when 924 cases per 100,000 population were recorded), there were no epidemic occurrences of these diseases in this five-year period. The measles-mumps-rubella (MMR) vaccine became a part of the EPI program in the Bahamas in April 1985. In 1986, coverage of children under 1 year old against DPT and polio was estimated at 85.1% and 81.3%, respectively. The proportion of 1-year-olds immunized for measles at this time was 80.7%.

In 1987 the major problems seen among children under 5 years old visiting the community health centers and clinics were: upper respiratory tract infections, acute gastroenteritis, injuries, ear diseases, and acute bronchitis. Together, these conditions represented 75% of the 12 main episodes of illness identified among this age group.

Regarding the health of schoolchildren 5-14 years old,

the principal health problems were accidents and injuries, respiratory system problems, skin disorders, and ear problems. Collectively, these constituted 57% of the nine key problems among schoolchildren who were treated in the clinics in 1987. Among problems identified during routine screenings conducted under the school health program, dental caries was the most prevalent. This problem was found in 23% of the total children screened by community nurses. The next most frequently identified problem was obesity. Among tenth-grade children alone, 10% were found to be overweight. Also, abnormal weight-for-age evaluation in infants and preschool children indicates that obesity is a more frequently occurring problem than underweight measurements. It appears that while protein-calorie undernutrition may be occurring in pockets of the population, very few cases exist at the Grade III level of the Gomez Classification. It is believed that illegal immigrants in poor socioeconomic circumstances constitute the bulk of this group.

Inpatient morbidity at the main hospital, Princess Margaret Hospital, is a useful indicator of the pattern and type of problems that result in general hospital admissions at a national level. The hospital, which serves a substantial portion of the country, handles 91% of the births in New Providence and 70% of the country's total births.

In 1987, among children under 5 years of age, pneumonia was the most common reason for admission to hospital; conditions originating in the perinatal period ranked second, and intestinal infectious diseases ranked third. Within the age group 5–14 years old, injuries and poisonings are the primary causes of admissions.

Health of Adolescents and Adults

The leading cause of death among 15–19-year-olds is transport accidents. All types of accidents and violence combined were the cause of death of 72% of the teenagers who died in 1987.

Data on hospital admissions categorize youths and young adults (15–24 years of age) together. Normal delivery was the principal reason for admissions at general hospitals and accounted for 53.9% of all admissions of 15–24-year-olds in Princess Margaret Hospital. This was followed by complications of pregnancy, childbirth, and the puerperium (representing 17.1% of admissions). Accidents and violence, diseases of the genitourinary system, diseases of the respiratory system, and diseases of the digestive system ranked next in order of frequency of admission.

Teenage pregnancies continue to be a problem. During the period 1983–1987 age-specific live-birth rates per 1,000 teenage women have ranged from 35.4 (1983) to 24.0 (1987). Among girls under 15 years of age there were approximately 4 births for every 1,000 females in

1984; by 1987 this rate declined to 1.25 per 1,000. Unfortunately, however, accurate statistics on all pregnancies, including abortions, are not available, and it is thought that the trends indicated by the birth rates might not hold if abortions were included in the picture.

The main problems affecting adult mortality are: malignant neoplasms, diseases of the heart, accidents and violence, and cerebrovascular diseases. For the population 20–44 years old, the most frequent underlying cause of death was also accidents and violence (35.3%). However, other causes such as malignant neoplasms, endocrine and metabolic diseases, immunity disorders, and diseases of the heart significantly add to mortality.

The major causes of hospital admissions for persons 25–44 years of age, are virtually the same as for 15–24-year-olds, except that diseases of the genitourinary system occur more frequently than accidents and injuries. Adults aged 45–64 are admitted to hospital in the Bahamas mostly for endocrine and metabolic diseases, of which diabetes is the most notable. Neoplasms, diseases of the digestive and circulatory systems, and injuries and poisonings follow.

Maternal and child health programs remain a top priority. Increasing emphasis has been placed upon antenatal care in the community, and clinic attendance has increased steadily over the years. Services are available throughout the Bahamas in both the public and private sectors, with less than 1% of all births occurring without a trained health professional in attendance.

For 1987, each client in the public sector averaged six visits during pregnancy, with 30% of the total clients making their initial visit at or before 16 weeks of pregnancy. An area of particular concern and interest is the routine screening for syphilis and gonorrhea within this service. Recently, attention also has been directed toward screening for other sexually transmitted diseases. For the decade, an average of 6% of pregnant women attending government clinics in New Providence had positive Venereal Disease Research Laboratories (VDRL) findings; in 1987 the figure was 5.7%.

All women who deliver are given appointments for a postnatal examination, which includes cytological testing. Postnatal coverage for 1984 was 66% in New Providence and 51% in the Family Islands.

Health of the Elderly

Among this age group, the leading causes of death include diseases of the heart (27.1% of all deaths among the elderly during 1987); malignant neoplasms (second leading cause and representing 22.8% of deaths); cerebrovascular diseases and diabetes (third leading cause and representing 13.7% of deaths); and diabetes (fourth leading cause and representing 7.5% of deaths).

The main causes for admissions to hospital among this age group were diseases of the circulatory system, followed by malignant neoplasms, endocrine and metabolic diseases (including diabetes), and injuries and poisonings.

Specialized services for the elderly are presently limited throughout the Bahamas. Nursing care and housing for this group have emerged as concerns which demand immediate attention.

Problems Affecting the General Population

During 1984–1988, epidemic activity was evident as follows: chickenpox (1984, 1987, 1988); mumps (1985); acute conjunctivitis (1986, 2,105 cases); hepatitis B (1988, 249 cases); and typhoid fever (1988, 6 cases).

Malaria cases occurred in 1987 (18 cases) and 1988 (17 cases); all cases reported were among non-Bahamians. Six of the cases in 1988 were of the *Plasmodium vivax* type and were seen in immigrant workers from India. All other cases reported were of *P. falciparum*.

HIV infection is a problem in the Bahamas. AIDS was first reported in 1985; at the end of 1988, a total of 269 cases were recorded—38.3% of these were females and case fatality was 48.3% among all cases. Fifty-two of the total reported cases (19.3%) occurred in children 0–14 years old; all but one were born to HIV-positive mothers. Between August 1985 and December 1988, 52 children were diagnosed as having AIDS. As of the end of 1987, a total of ten children were identified as carriers of the disease.

In 1987, 90 AIDS cases were diagnosed. A detailed investigation of these cases reveals that 53 cases (72% of the 73 adult cases) occurred among heterosexuals. Also, of these 73 adult patients, 33 (45%) were cocaine abusers.

Between August 1985 and December 1988, 799 healthy carriers were identified. In 1988 alone, 419 well persons investigated were found to be infected with HIV.

Alcohol and cocaine are the predominant drugs of abuse in the Bahamas. Consequences of abuse are monitored through reports from Sandilands Rehabilitation Center, a psychiatric hospital serving all of the Bahamas, and from the Community Psychiatry Clinic in New Providence. Incidences of problems resulting from cocaine use escalated sharply in 1984. Subsequently, the Community Psychiatry Clinic experienced an overall leveling off in the number of new clients. At Sandilands Rehabilitation Center, however, first-time admissions for cocaine abuse peaked in 1987.

Among males and females, drug abuse is the number one cause for admissions to the psychiatric hospital. The problem is more significant, however, in males than females. In 1985, 32.9% of the males admitted to this

hospital had drug abuse as a principal diagnosis, while this problem was indicated in only 13.8% of the female admissions. Alcoholism was seen in 17.8% of the males and 11.9% of the females at this institution in 1985.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

The Ministry of Health, the second largest Ministry within the governmental structure, has a staff of about 4,500 and is responsible, through the Minister of Health, for setting national health policies and for implementing and evaluating health programs.

The health sector is made up of a tiered network of health facilities, both public and private, with referral linkages between the various levels of service. The archipelagic geophysical configuration of the Bahamas carries with it special problems of logistics in the delivery of health services. These include transportation, communication, supply management, and coordination of services. This necessitates provision of an adequate infrastructure to ensure that urban as well as underserved rural populations have access to appropriate levels of health care.

There are three public hospitals for acute care: the Princess Margaret Hospital in New Providence, a general hospital with 454 beds; the joint psychiatric (255 beds) and geriatric (151 beds) facility at the Sandilands Rehabilitation Center; and another general hospital in Grand Bahama, the Rand Memorial Hospital, with 74 beds. In addition, New Providence has one private hospital with 30 beds. In 1988, the occupancy rate for Princess Margaret Hospital was 74% with an average length of stay of eight days, while the corresponding figures for Rand Memorial Hospital were 57% and four days.

Primary health care services in New Providence are delivered from government health centers, the ambulatory care department of Princess Margaret Hospital, and private physicians' offices. Outpatient services are offered through general practice clinics, specialty clinics, and emergency services.

Outpatient care is receiving increasing emphasis as a matter of community economics. Ambulatory care operating theatres are the most recent outpatient services to be organized as separate entities.

The need for improved community psychiatric services led to the opening of a clinic on the grounds of the Princess Margaret Hospital, which directs its efforts toward drug abuse, including alcoholism, and other mental disturbances.

In order to meet the needs of women, a woman's crisis center was opened to deal with problems such as rape, battering, and attempted suicide. This clinic has approx-

imately 25 referrals per month from the accident and emergency department.

In the Family Islands, primary health care is delivered by physicians, community nurses, midwives, and health aides through a network of strategically located facilities comprising 12 health centers, 35 main clinics, and 51 satellite clinics. For management purposes, these are arranged in 20 health districts. In 1988 these districts were staffed by 20 physicians, 3 dentists, 90 nurses of various categories, and health aides.

A trend toward decentralization of service areas which emerged earlier in the decade has been significantly strengthened with government policy decision, in principle, having been taken in 1988 to decentralize the operations of the two major hospitals as devolved units. This is expected to be effected in the early 1990s. Decision has also been taken in 1988 to replace the physical facilities of Princess Margaret Hospital and Rand Memorial Hospital, as well as to increase and upgrade existing Family Island facilities.

A working party appointed by the Government to consider alternative methods of health financing issued its report in 1987, and the Government has accepted, in principle, its main recommendations for the establishment of a national health insurance plan. Subsequently, the Government has undertaken dialogues with the public to ascertain its reaction to specific recommendations; the plan is slated to begin in 1991–1992.

In 1988, the Government identified priority areas for further infrastructural and institutional strengthening, including policy formulation, planning, and programming; organizational and managerial reforms; human resources development; health information; financial management; health facilities maintenance; and health regulations.

In 1986 the government service had 187 physicians, 17 dentists, 579 registered nurses, 405 trained clinical nurses, and 199 health aides.

The 1988 total national recurrent budget was \$US512 million, with 14.4% allocated to the Ministry of Health. The total capital budget for 1988 was \$US79.7 million, with health receiving 5.9%. These figures, taken together, represent a per capita health expenditure of \$US329 in that year.

HEALTH AND THE ENVIRONMENT

The Department of Environmental Health Services within the Ministry of Health is the leading agency in all matters pertaining to environmental health, although other Ministries and Departments collaborate on major environmental projects. The Water and Sewerage Corporation, a public agency established in 1976, is respon-

sible for providing potable water to consumers on the Island of New Providence, where 65% of the population lives. The water division in the Ministry of Works and Lands oversees the production and distribution of potable water on the Family Islands, except for Freeport, Grand Bahama, which is under the jurisdiction of the Port Authority.

The main sewerage system primarily serves the downtown area of Nassau, or about 15% of the urban population; the rest of the population uses septic tanks and, to a lesser extent, pit latrines.

More than 90% of all water consumed in the Bahamas comes from groundwater supply, between 3%–4% is collected rainwater, and about 1% is produced by reverse osmosis. New Providence, which is by far the largest consumer of water, experienced serious shortages prior to 1975. The large demand was a result of heavy migration from the outer islands and of the rapid growth of tourism. To alleviate this problem, the Government initiated a program of bringing water from the neighboring island of Andros to the capital.

The water mains date back to the early 1900s. The Government, through the Water and Sewerage Corporation, is undertaking a massive water main replacement program which has greatly improved the microbiological quality of water. However, the imbalance of supply and demand affects the ability to reduce the high salinity levels of the supply. On the island of New Providence, 73% of the population is served by house connections; 23% has reasonable access to public standpipes.

Up to 1988, and especially in the last five years, the volume of solid waste has increased to up to twice the 1982 level due to tourism development and community expansion. The Department of Environmental Health Services collects and disposes of about 50% of the waste in New Providence. With technical assistance from this department, the collection and disposal of solid waste in the Family Islands is administered by the Department of Local Government within the Ministry of Transport and Local Government and by the Port Authority in Freeport, Grand Bahama.

In 1980, the Department of Environmental Health Services reported nine air pollution incidents. By 1984 the number had risen to 77, but decreased significantly by the end of 1986 due to more effective regulations, field monitoring, community awareness, and educational efforts.

Food sanitation and food handling is of primary concern to the Department of Environmental Health Services, as well as being an essential component of the tourist industry. In 1988, the number of inspections of eating establishments and food processing plants had increased by approximately 50% since 1985. The food, drink, and dairy quality control programs have been rein-

forced by statute, by the establishment of a Food Standards Board, and by an expanded and more vigilant Port Health Program.

Between 1984 and 1985 the *Aedes aegypti* household infestation index on the island of New Providence decreased

from 35% to 19%; and by the end of 1988, the index had been reduced to 9%. As of 1988, surveys of mosquito densities in the more populated and more frequented by tourists Family Islands exhibited predominantly a nuisance species at a Breteau Index below 5% for *A. aegypti*.

BARBADOS

GENERAL CONTEXT

Political, Economic, and Social Situation

Barbados is a constitutional monarchy and a parliamentary democracy within the Commonwealth of Nations. It is 431 square kilometers in area and had an estimated population of 253,900 in 1987. The Government of the United Kingdom is represented by the Governor General. The Head of Government is the Prime Minister, who appoints the Cabinet. The Cabinet is responsible to the Parliament, which consists of two chambers—the Upper House, or Senate, with 21 members and the Lower House, or House of Assembly, with 27.

Between 1983 and 1987, the economy expanded. Economic activity is based on tourism, services, light manufacturing, and agriculture. Tourism has grown steadily and contributed \$US93 million to the GDP in 1983 and \$US135 million in 1987. After 1985, the manufacturing sector suffered a major setback when electronics plants closed due to increased competition from Pacific Rim countries. Manufacturing contributed \$US132 million to the economy in 1984, but only \$US112 million in 1987. The per capita GDP in 1987 was \$US4,930.

Barbados consistently runs a negative balance on international trade. This negative balance increased with the drop in electronic goods exports and the contraction of intra-Caribbean trade following the economic crises affecting the subregion. The gap has been met by earnings from services and tourism and by capital inflow, some of it from foreign loans.

The external debt grew from \$US732 million in 1983 to \$US1,139 million in 1987, and the debt service ratio was 3.1%. The inflation rate decreased from 5.3% in 1983 to 1.3% in 1986, and then increased to 3.3% in 1987. Unemployment increased from 16.9% in 1983 to 22.9% in 1987. The latest estimate is 18.6% for 1989. Although accurate unemployment data are unavailable, it is estimated to be significant. The unemployment increase has been due mostly to a decline in employment in the manufacturing sector.

Adult literacy is estimated at 98%, although this estimate may be unreliable. All eligible children aged 5–15 years are enrolled in school.

Demographic Characteristics

The population grew from an estimated 251,300 in 1983 to 253,900 in 1987, an average of 0.2% growth per year. The percentage annual growth rate was 0.4% in 1983, 0.2% in 1985, and 0.08% in 1987. The birth rate declined steadily from 18 per 1,000 population in 1983 to 15 in 1987, and the fertility rate declined from 77 per 1,000 women aged 15–44 years in 1983 to 59 in 1987. An ongoing family planning program, as well as an AIDS education program and a growing interest in family life education, has been largely responsible for maintaining the relatively low fertility and birth rates. The elderly population (65 years and older) was estimated at 28,800, or 11.3% of the 1987 population.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

The leading cause of death in 1984, 1985, and 1986 was heart disease (ICD codes 393–398, 410–429), with 435, 463, and 432 deaths, respectively; the second cause was malignant neoplasms (codes 140–208), with 358, 362, and 411 deaths, respectively; in those years. The third, fourth, and fifth causes of death in each of the three years were cerebrovascular disease (codes 430–438), diabetes mellitus (code 250), and “other” diseases of the circulatory system (codes 440–459).

Health Situation of Specific Population Groups

Child Health

An analysis of the infant mortality rate shows that the postneonatal component has remained at a constant low, while the neonatal component has sustained high levels. Neonatal mortality and the stillbirth rate (13.0 in 1987) constitute major concerns in child health, especially

given the fact that almost all deliveries take place in hospital. To improve the care of the newborn, a new neonatal unit at the main hospital, Queen Elizabeth Hospital, is under construction.

Health in infants and in children under 5 years old has been well maintained through the network of polyclinics that offer free maternal and child health services. Key components of these services include growth monitoring, nutrition counseling, immunization, and family planning and family life education. Antenatal care also achieves relatively high coverage; a single maternal death in three years attests to the quality of antenatal and intranatal care.

Health of Adolescents and Adults

Chronic noncommunicable diseases are the main causes of death and chronic illness in the adult population. The high prevalence rate of hypertension (22% in persons 18 years and over) provides a basis for the fact that heart disease, most of which is of hypertensive origin, and cerebrovascular accidents are the first and third causes, respectively, of mortality. Diabetes is believed to affect between 6% and 8% of the total population; it is mainly responsible for the many lower limb amputations performed each year and is among the three leading causes of blindness. In 1984 hypertension accounted for 18.8% of all clinic visits throughout the island, and diabetes for 15.8%. Malignant neoplasms are the second main cause of mortality in this age group. Cervical cancer remains the leading malignancy among females, and the incidence of breast cancer continues to rise. The leading malignancy among males is cancer of the prostate.

There is a wide spectrum of mental health disorders, and in recent years the number of patients treated for substance abuse has increased notably. Mental health care is largely confined to inpatient and outpatient services provided at hospitals.

Deaths from traffic accidents are increasing, and constitute the main cause of death in the 15–25-year-old age group. The first case of AIDS was reported in 1984, and since then, approximately 20 new cases have occurred yearly. Most cases have been male homosexuals, but there is evidence of increasing heterosexual transmission.

Obesity is a major problem. A comparison of nutritional surveys carried out in 1969 and 1981 revealed that obesity had increased from 32% to 50% among middle-aged women and from 7% to 28% among men. The 1980 survey also revealed that obesity is a major finding among adolescent girls.

Health of the Elderly

Arthritis, hypertension, and diabetes have been identified as major disorders, and heart disease and cerebrovascular disease are the leading causes of mortality.

The majority of chronic adult disability occurs in this age group. Blindness is a major disability. Although cases of cataracts have markedly decreased over the past decade, chronic glaucoma and diabetic retinopathy cases are increasing. Prevalence of glaucoma is high.

Institutional care of the elderly is provided at one geriatric and six district hospitals. Of the elderly in those institutions, an estimated 52% require medical care, while 48% are there merely because of socioeconomic reasons. Currently, custodial care is stressed less, and efforts are being directed towards caring for the elderly in the community.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

The Ministry of Health is responsible for the provision of public health services in the country. Policy decisions for the health services are made by the Minister of Health on the advice of the Permanent Secretary for Health and the senior technical officers. The Minister of Health is responsible to the Cabinet of Ministers for the provision of government health services.

Responsibility for managing Barbados' health system is vested in the Ministry of Health. Day-to-day management is delegated to the Permanent Secretary and through him to the technical and administrative staff within the Ministry, hospitals (acute general, psychiatric), leprosarium, polyclinics/health centers, and outpatient clinics. The Chief Medical Officer advises the Minister and the Permanent Secretary on all professional matters affecting the country's health.

For each priority program and/or service, a plan of action is drawn up which details the programming of specific activities and the allocation of resources. Community participation, intersectoral coordination, use of appropriate technology, and primary health care teams are strongly emphasized.

Over the years, the delivery of health care has been carried out through a system of health centers located throughout the island and through hospitals in and around the capital city, Bridgetown. Barbados' health system is based on the concept of three levels of care, which incorporates the combination of interdependent primary, secondary, and tertiary health care services. Since this system is inherently committed to the goal of health for all by the year 2000, the use of primary health polyclinics and health centers throughout the island and the corresponding development of clinics and outreach programs have been stressed.

The Government's Health Services Development Plan, 1983–1987, addresses the issue of equity in health and uses the primary health care strategy to implement its

philosophy for extending health service coverage to the entire population. The plan emphasizes prevention and control of communicable and noncommunicable diseases, particularly chronic diseases such as hypertension, diabetes, and cancer; the dental health program; the community mental health program; maternal and child care, including postnatal and medical care, family life development, and family planning; care of the aged; and health care for the poor. Current health policies are under constant review and the health system has built-in flexibility.

In 1988, the Ministry completed its Health Development Plan, 1988–1993. Steps are being taken to improve management capability through improved information management, especially regarding secondary care facilities.

The Government considers as primary health care all those services provided at first contact between the health consumer and the health professional, including health promotion and maintenance for the complete and continuous care of the individual. Ambulatory and primary care are provided at the polyclinics and/or health centers and subcenters and also at outpatient clinics. Hospitalization, secondary health care, and specialized or tertiary care are provided at the Queen Elizabeth Hospital, the acute general hospital. Barbados serves as a referral center for tertiary health care for Eastern-Caribbean-island patients in need of attention in fields such as internal medicine, surgery, radiotherapy, ophthalmology, and otolaryngology. Two private hospitals also provide secondary and tertiary health care.

Services delivered at Queen Elizabeth Hospital's organized departments include: clinical, ancillary, and outpatient services; nursing services; and personnel, maintenance, engineering, and supplies services.

The hospital's staff includes 121 doctors (including 44 specialists), 417 nurses, and 3 administrators. The hospital is well-organized for medical, undergraduate, and postgraduate training. The upgrading of the physical infrastructure and the institutional development of the hospital in 1986–1989 were accomplished with funds from the Inter-American Development Bank and with technical cooperation of PAHO/WHO.

Table 1 shows the attendance at outpatient services of the Queen Elizabeth Hospital and at polyclinics and other primary care clinics. Table 2 shows the bed utilization at Queen Elizabeth Hospital during 1985 by selected major disciplines in medicine.

The key institution for primary health care is the polyclinic. The countrywide network of polyclinics has been strategically located to ensure an equitable distribution and easy access to referral facilities.

In recent years the Government constructed eight polyclinics that provide a wide range of services at the community level. The populations served by these new clinics

| Type of establishment | No. |
|--|---------|
| Queen Elizabeth Hospital Specialist clinics | 88,516 |
| Casualty and general outpatients | 78,524 |
| Diabetic ^a | 2,609 |
| Polyclinics/health centers ^b | 171,549 |
| District outpatient clinics/general practice clinics ^c | 69,177 |
| General practice unit ^d | 12,070 |

^aThese are not included above and are mainly insulin injections.

^bInclude visits to venereal disease clinics, maternal and child health clinics, dental clinics, eye clinic, and visits for immunizations, but exclude visits to the general practice clinic.

^cWelfare and general practice clinics.

^dTeaching unit of the University of the West Indies.

Source: Ministry of Health, Barbados.

are as follows: Maurice Byer, 23,537; Warrens, 30,548; Black Rock, 28,294; Sir Winston Scott Memorial, 55,336; Edgar Cochrane, 32,300; Randall Phillips, 38,560; Six Cross Roads, 20,782; and Glebe, 21,033.

The development of an efficient network of polyclinic services is a national priority. The country's small size, good roads and road network, efficient transportation system, and improved ambulance service have all contributed to easy access to hospital and health center services.

The major referral center is the Queen Elizabeth Hospital in Bridgetown, and no community is more than one hour away from it. Until recently, it was the only government institution open to the public after 4:30 p.m. and on weekends; however, there now are four polyclinics in key areas that offer extended hours and services for half a day on Saturdays.

Unless a person chooses private care, health care in the public sector is free.

Since its establishment in 1980, the Barbados Drug Service has prepared, maintained, and updated the National Drug Formulary, which is widely distributed to health professionals in the country's health services. The Drug Service supplies drugs to all government hospitals, district hospitals, polyclinics, outpatient clinics, and (for a fee) to the Barbados Defense Force and Her Majesty's Prisons. It has a unique working relationship with the private sector, which has the prime responsibility for drug procurement, storage, and distribution. The Drug Service has developed a reliable and cost-effective drug supply management system, and periodically issues a Drug Information Bulletin which provides updated technical information on drugs and on the Service's activities.

TABLE 2

Bed utilization at the Queen Elizabeth Hospital by service, Barbados, 1985.

| Item | Total | Medicine | Surgery | Obstetric | Pediatric | Gynecology | Otolaryngology | Orthopedic | Ophthalmology | Radiotherapy | Intensive care unit |
|------------------------|------------------|----------|---------|-----------|-----------|------------|----------------|------------|---------------|--------------|---------------------|
| Number of beds | 530 ^a | 96 | 134 | 58 | 47 | 32 | 18 | 38 | 35 | 23 | 6 |
| Admissions | 19,822 | 3,300 | 3,125 | 5,616 | 2,081 | 2,961 | 921 | 705 | 652 | 266 | 195 |
| Average length of stay | 8 | 10 | 14 | 4 | 6 | 4 | 4 | 16 | 12 | 18 | 12 |
| % occupancy | 77 | 96 | 83 | 110 | 62 | 101 | 57 | 84 | 56 | 52 | 81 |
| Bed turnover rate | 36 | 34 | 23 | 92 | 43 | 92 | 36 | 18 | 19 | 12 | 22 |
| Major operations | 4,373 | — | 1,286 | 448 | — | 1,065 | 625 | 507 | 442 | — | — |

^aAlso includes 43 unallocated private ward beds.

Source: Ministry of Health, Barbados.

HEALTH AND THE ENVIRONMENT

Given Barbados' high population density, sandy beaches, and major tourism industry, poor environmental management can lead to pollution and coastal degradation. The results of inadequate controls are already apparent. However, national pride and the discipline of the people have begun to pave the way for improvements in both the public and private sectors.

The island has no rivers and stores its water resources underground. Recent studies indicate that there is groundwater pollution despite existing zonal and legislative controls.

Despite the construction of the Bridgetown Sewerage System earlier in the past decade, many buildings in the capital are not connected and still use septic tanks and groundwater-polluting absorption pits. The south and west coasts, which have a considerable number of commercial and tourist buildings, are not sewered, and the pollution of coastal waters by raw sewage continues. Most package sewage treatment plants in hotels do not function properly.

The growing use of toxic and hazardous chemicals by industrial, agricultural, and domestic sectors has not yet led to a "cradle-to-grave" management system for locally produced or imported chemicals, nor has a special site or facility been established for the disposal of such wastes.

In the Government, environmental management responsibilities are shared by several ministries, such as the Ministries of Health, Housing, Labor, Agriculture, and others. Without an umbrella agency to coordinate the

overall effort, the various facets of environmental health management are covered by different organizational units in a specialized way. An example of this is the work of the Ministry of Labor in occupational health and safety. This situation, along with a vertical legislative framework, badly needs updating in order to achieve more effective program coordination and implementation at the national level.

Two major issues which are being successfully tackled are solid waste management by the Barbados Sanitation Service Authority and a sewage disposal project (assisted by the Inter-American Development Bank) for the design and construction of sewerage systems on the south and west coasts.

An environmental education and awareness program is promoted by various government agencies and by several nongovernmental organizations.

The vector-control program is decentralized into six zones. Within each zone, a vertically organized team conducts routine house-to-house inspections and focal/perifocal treatments. A small solid waste removal program has been incorporated into the vector-control program in an effort to reduce the number of potential breeding sites. Adulticidal fogging is carried out as an abatement procedure in areas with high indices for *Aedes*. Physical control measures and fogging have been implemented in recent months to reduce densities of *Anopheles aquasalis* in the south of the island. In 1989, PAHO spot-check surveys in two zones gave *Aedes* household infestation indices of 11.8% and 15.0%. Some dengue activity was reported in late 1987 and early 1988.

BELIZE

GENERAL CONTEXT

Political, Economic, and Social Situation

Belize became independent from the United Kingdom in 1981. Its Constitution establishes a parliamentary democracy, with the Queen of the British Commonwealth as titular head of state. The Queen appoints a Governor General as her representative in the country. The Governor General appoints the Prime Minister—the leader of the political party with a majority of members in the House of Representatives—and also appoints, on the advice of the Prime Minister, Ministers of Government from among members of the House and Senate. The Cabinet, which consists of the Prime Minister and Ministers of Government, directs the policy of the Government of Belize and is collectively responsible to the National Assembly for its actions. The National Assembly is a bicameral legislature with an elected House of Representatives and an appointed Senate. An elected city council and five elected municipal town boards constitute Belize's local government.

The country has an open economy, which in 1987 expanded more than 5% in real terms. Trade is basically unrestricted and the national currency exchange is \$B2.00 to \$US1.00. The deficit fell from 12% of the GDP in 1984 to 8% in 1987, mainly due to increases in exports of citrus, bananas, fish, and other products and to growth in the agricultural and manufacturing sectors. Foreign exchange remittances from Belizeans living abroad totaled more than \$B31 million in 1988. The GDP in 1987 was \$US198.35 million and GDP per capita was \$US1,132, up from \$US1,039 in 1983 (Table 1).

The United States accounts for 60% of Belize's exports and for more than 50% of its imports; the United Kingdom accounts for 34% of exports and 6% of imports. Frequent fluctuations in the real exchange rate of the Mexican peso have gradually increased Mexico's share of Belize's imports.

Total external public debt by the end of December 1988 amounted to \$US120.8 million.

In the health sector and in other sectors, large public projects are mostly foreign financed. The private sector provides small-scale investments in production activities,

while the Government meets recurrent costs of existing and social capital.

Although official data on highest and lowest levels of socioeconomic indicators are unavailable, there are substantial inequalities in income associated with geography, historical development of the country, and the degree of integration into the market of some segments of the population. Certain risks also threaten specific vulnerable groups, such as malaria affecting agricultural workers. The labor force survey showed that the national unemployment rate was 14%, slightly less than the 14.3% reported in the 1980 census. The literacy rate is 92%, and 85% of the population completes primary school.

Demographic Characteristics

In 1988, the country's estimated population was around 180,000; 52% resided in eight urban centers and 28% lived in Belize City (1980 census). The annual average population growth rate between 1970 and 1983 was 2.5%, with crude birth rates (36 per 1,000 population) remaining fairly stable since 1970. In 1981, life expectancy at birth was 71 years. The total fertility rate decreased from 5.8 per woman in 1980 to 5.0 in 1988. The infant mortality rate was 21.3 per 1,000 live births in 1987.

The 1980 census sets the median age at 16.5 years, with 45% of the population being under 15 years of age. Between 1980 and 1987, the population 60 years and older increased from 6.5% to 11%.

Eight ethnic groups live in the country: Creoles (40%), mestizos (33%), Garinagu (8%), Maya Mopan (7%), Maya Ketchi (3%), and smaller percentages of Chinese, East Indians, and whites. The principle of racial and cultural pluralism forms the basis for national integration, and Belize has remained relatively free of racial and ethnic conflicts.

There is no accurate count of refugees residing in Belize, but estimates range from 15,000 to 40,000. Although data are not available, fertility rates are thought to be high among them. The country's rapid population growth and immigration from neighboring republics are offset by the ongoing emigration of Belizeans to the United States. Population statistics suggest that as many

| Year | Population ^a | Gross domestic product ^b | GDP per capita ^c | Government expenditure for health services ^b | % of total government expenditure on health | Government health expenditures as % of GDP | Public health expenditure per capita ^c |
|------|-------------------------|-------------------------------------|-----------------------------|---|---|--|---|
| 1982 | 153.4 | 166,056 | 1,082 | 4,413 | 10.5 | 2.7 | 29 |
| 1983 | 157.7 | 163,833 | 1,039 | 4,669 | 11.4 | 2.8 | 30 |
| 1984 | 162.1 | 168,605 | 1,040 | 4,806 | 9.9 | 2.9 | 30 |
| 1985 | 166.2 | 174,357 | 1,048 | 4,842 | 10.9 | 2.8 | 29 |
| 1986 | 170.4 | 179,665 | 1,054 | 5,114 | 9.2 | 2.8 | 30 |
| 1987 | 175.2 | 198,346 | 1,132 | 5,699 | 9.8 | 2.9 | 32 |

^aIn thousands.

^bIn thousands of \$US.

^cIn \$US.

Source: Central Statistical Office, Abstract of Statistics, Belize 1988.

as one of every eight residents have emigrated during the last ten years.

Belize faces the future in an unusual demographic situation: rapid growth despite continued net emigration and continued low population density. This is a situation which allows for future growth.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

Between 1984 and 1987 the general mortality rate fell from 4.6 per 1,000 inhabitants to 3.9. Mortality conditions should be interpreted with caution, however, because of possible deficiencies in certification of causes of deaths and the small number of deaths involved. In addition, socioeconomic differences among geographic areas must be considered.

The leading causes of death indicate a predominance of chronic diseases associated with the older age groups. Lung diseases, heart disease, cancer, intestinal infectious diseases, and certain conditions originating in the perinatal period were the leading causes of death during 1985–1987 (Table 2).

Existing data suggest that the health services will have to focus more care on the needs of the elderly. This has serious implications for health care financing, since the health care delivery system is presently geared toward the prevention and treatment of acute conditions, particularly in children and mothers. Given the population structure,

however, maternal and child health care cannot be downgraded.

Health Situation of Specific Population Groups

Child Health

Between 1984 and 1987 infant mortality rates per 1,000 live births dropped from 23.4 to 21.3, and mortality rates per 10,000 population in children aged 1–4 years increased from 1.5 in 1984 to 2.2 in 1986. The three leading causes of infant (Table 3) and child mortality remain certain conditions originating in the perinatal period, diseases of the respiratory system, and infectious and parasitic diseases. Almost all infant deaths from infectious and parasitic diseases are due to intestinal infectious diseases, and most occur in the first week of life. Among children aged 1–4 years, most deaths due to infectious and parasitic diseases are due to intestinal infectious diseases.

Measles, whooping cough, and tetanus have almost been eliminated as causes of death in infants (two deaths in 1985, one in 1986, and none in 1987) and children aged 1–4 (no deaths in the period). The low level of reported cases of diphtheria, pertussis, tetanus, poliomyelitis, tuberculosis, and measles may be a result of activities carried out since 1986 under the Expanded Program on Immunization (EPI). The extensive use of oral rehydration therapy probably has contributed to significantly reduce the mortality rate from gastroenteritis.

| Cause group | 1985 | | | 1986 | | | 1987 | | |
|--|------|-----|------|------|-----|------|------|-----|------|
| | Rank | No. | Rate | Rank | No. | Rate | Rank | No. | Rate |
| Certain conditions originating in the perinatal period (760-779) | 3 | 62 | 0.4 | 5 | 51 | 0.3 | 1 | 126 | 0.7 |
| Diseases of the respiratory system | 2 | 65 | 0.4 | 1 | 121 | 0.7 | 2 | 105 | 0.6 |
| Heart disease (393-398, 410-429) | 5 | 55 | 0.3 | 2 | 82 | 0.5 | 3 | 83 | 0.5 |
| Cancer | 1 | 68 | 0.6 | 6 | 47 | 0.3 | 4 | 74 | 0.4 |
| Cerebrovascular diseases | 6 | 49 | 0.3 | 4 | 63 | 0.4 | 5 | 44 | 0.2 |
| All accidents, excluding motor vehicle | 4 | 55 | 0.3 | 3 | 66 | 0.4 | 6 | 42 | 0.2 |
| Intestinal infectious diseases | 8 | 33 | 0.2 | 9 | 27 | 0.2 | 7 | 31 | 0.2 |
| Hypertensive disease | 9 | 30 | 0.2 | — | ... | ... | 8 | 31 | 0.2 |
| Diabetes mellitus | 7 | 39 | 0.2 | 7 | 44 | 0.3 | 9 | 23 | 0.1 |
| Diseases of the digestive system | — | ... | ... | 10 | 26 | 0.2 | 10 | 20 | 0.1 |
| Diseases of the circulatory system | 10 | 25 | 0.2 | 8 | 42 | 0.2 | — | ... | ... |

Source: Unit of Health Statistics, Ministry of Health, Belize.

| Cause group | 1985 | | | 1986 | | | 1987 | | |
|--|------|------|------|------|------|------|------|------|------|
| | No. | Rate | Rank | No. | Rate | Rank | No. | Rate | Rank |
| All causes | 131 | 21.5 | — | 152 | 24.6 | — | 144 | 21.3 | — |
| Conditions originating in the perinatal period | 61 | 10.0 | 1 | 51 | 8.3 | 1 | 58 | 8.6 | 1 |
| Diseases of the respiratory system | 26 | 4.3 | 2 | 28 | 4.5 | 2 | 30 | 4.4 | 2 |
| All infectious and parasitic diseases | 16 | 2.6 | 3 | 20 | 3.2 | 3 | 19 | 2.8 | 3 |
| Congenital anomalies | 10 | 1.6 | 4 | 5 | 0.8 | 5 | 5 | 0.7 | 4 |
| Nutritional deficiencies | 3 | 0.5 | 5 | 7 | 1.1 | 4 | 4 | 0.6 | 5 |
| Other causes | 12 | 2.0 | — | 25 | 4.1 | — | 17 | 2.5 | — |
| Ill-defined causes | 3 | 0.5 | — | 16 | 2.6 | — | 11 | 1.6 | — |

Source: Unit of Health Statistics, Ministry of Health, Belize.

Health of Adolescents and Adults

There has been a decrease in deaths due to infectious and nutritional deficiencies and an increase in deaths due to chronic conditions such as cardiovascular disease and cancers. The leading cause of death in women during 1985–1986 was cancer of the cervix (40% of all deaths). These data must be interpreted with caution, however, since cytological screening programs are inadequate and figures are derived from certificates and not always from pathology reports.

As shown in Table 4, maternal morbidity continues to be the most frequent cause of hospitalization, normal deliveries excluded. In 1985 and 1987, pregnancy complications were the main cause of hospitalization at Belize City Hospital. Abortion was also among the leading causes of hospitalization throughout the period.

In 1986, 70% of women whose babies were born alive received antenatal care in public clinics. Sixty-six percent of deliveries were institutional and 19% were by traditional birth attendants. Four maternal deaths occurred countrywide in 1986. The most common causes of maternal death were infection and hemorrhage during pregnancy and childbirth and toxemia. Belize has no family planning program due to a Cabinet decision. Nevertheless, family life education is being delivered through maternal and child health program activities.

Health of the Elderly

Little information on the health status of the elderly is available. No specialized services exist for attending to their health care needs, apart from a small infirmary where 20 to 30 homeless elderly are accommodated.

| Cause | 1985 | | | 1986 | | | 1987 | | |
|--|------|-----|------------|------|------|------------|------|-----|------------|
| | Rank | No. | % of total | Rank | No. | % of total | Rank | No. | % of total |
| Complications of pregnancy, childbirth and the puerperium (640–646, 647, 648, 651–676) | 1 | 702 | 10.0 | 2 | 1021 | 6.2 | 1 | 652 | 4.0 |
| Abortion (630–639) | 3 | 412 | 5.8 | — | 599 | 3.6 | 2 | 600 | 3.7 |
| Diseases of specified parts of the digestive system (530–579) | 2 | 473 | 6.7 | 3 | 925 | 5.6 | 3 | 503 | 3.1 |
| Hypertensive disease (401–405) | — | ... | ... | — | ... | ... | 4 | 500 | 3.1 |
| Diseases of pulmonary circulation and other forms of heart disease (415–429) | — | ... | ... | 1 | 1299 | 7.8 | 5 | 492 | 3.0 |
| Specified diseases of the respiratory system (480–519) | — | 272 | 3.8 | 4 | 876 | 5.3 | — | 394 | 2.4 |
| Diseases of female genital organs (610–629) | 4 | 368 | 5.2 | — | 516 | 3.1 | — | 392 | 2.4 |
| Intestinal infectious diseases (001–009) | — | 167 | 2.3 | 5 | 705 | 4.3 | — | ... | ... |
| Certain conditions originating in the perinatal period (760–779) | 5 | 294 | 48.2 | — | ... | ... | — | ... | ... |

Source: Unit of Health Statistics, Ministry of Health, Belize.

Problems Affecting the General Population

Communicable diseases constitute an important cause of morbidity in the country. The five most frequently reported communicable diseases in 1986 were: malaria, gastroenteritis, gonorrhoea, chickenpox, and syphilis. The incidence of tuberculosis continues to decline, from 3.9 per 10,000 population in 1985 to 2.4 in 1987. Canine rabies was reintroduced in the country in 1987; one human fatality occurred in 1988.

Tropical diseases of concern in Belize are: leptospirosis, which is endemic in the country; Chagas' disease; and schistosomiasis. Leprosy has not been reported as a health problem, but due to the influx of refugees from endemic zones in neighboring countries, it might become a factor.

Malaria is endemic. The extensive eradication program carried out in the 1950s and 1960s virtually eradicated malaria. However, fiscal constraints and new agricultural production patterns led to insufficient follow-up after the campaign, resulting in a dramatic increase in incidence of cases from 876 in 1977 to 4,595 in 1983. From 1984 to 1986, the number of cases decreased, but they remain at around 3,000 cases per year.

Five unconfirmed cases of dengue fever were reported in 1986. The first AIDS case was reported in Belize in 1986. Since then, 14 cases of symptomatic AIDS and 11 HIV-positive cases have been reported. The prevalence of the disease within the country is not known. Of the 25 cases identified, 3 were prostitutes, 11 were homosexual or bisexual men, 1 was through maternal transmission, and 10 were unknown. As of January 1988, all blood has been screened for HIV using the ELISA test.

A national nutritional survey has been planned for 1989. There is no available information on prevalence of nutritional deficiencies.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

The Government recognizes health as a basic human right and a fundamental aspect of the development process, and is committed to provide health services to every Belizean using community participation and intersectoral coordination as key elements. The national health policy is guided by the principles of democracy, comprehensiveness, education, participation, and accessibility.

The health plan identifies mothers and children from birth to 5 years old, low income groups, the disabled, the elderly, and those living in underserved areas as priority groups. In addition, the prevention and treatment of high-prevalence diseases and conditions also is considered a priority. The plan emphasizes manpower training with appropriate technical and managerial skills geared to local

needs and resources, with an integrated approach to preventive and curative health care, and with the capability to function as part of a health team. The need to decentralize program execution and management to the peripheral level through a local health systems approach also is considered.

In 1987, government health care expenditures represented 2.9% of GDP (at constant 1984 prices) and 9.8% of the national budget, equivalent to around \$US32 per capita per annum (Table 1). The percentage distribution of the budget according to program areas in 1987 was: central administration, 12.6%; primary health care, 21.6%; district hospitals, 19.4%; national hospitals, 29.7%; supplies, 12.5%; and the Belize School of Nursing, 4.2%.

Government health services are practically free, including the provision of pharmaceuticals, and are funded by central government revenue. The Social Security Scheme begun in 1981 covers only health expenses due to occupational illness or accident.

A national network of 31 health clinics and 5 primary level hospitals form the basic infrastructure for primary health care. Belmopan Hospital is the only acute medical care public facility at the secondary level in the country. As a referral center it receives patients from all the other district hospitals. In 1986, 68.5% of all institutional deaths occurred there. There are 422 hospital beds in the country (one bed per 427 inhabitants) and one health center per 5,819 inhabitants. The distribution of beds and centers per population varies among the districts. There are two health care clinics operated by private denominational groups and three private clinics run for profit.

Approximately 88.6% of the population is covered by

| Occupations | 1980 | 1985 | 1986 | 1987 |
|------------------------|------|------|------|------|
| Physicians | 55 | 78 | 77 | 85 |
| Ratios | 3.8 | 4.7 | 4.5 | 4.8 |
| Dentists | 8 | 12 | 12 | 12 |
| Ratios | 0.6 | 0.7 | 0.7 | 0.7 |
| Nurses | 179 | 229 | 229 | 230 |
| Ratios | 12.3 | 13.8 | 13.4 | 13.1 |
| Opticians ^a | 3 | 4 | 4 | 5 |
| Chemists/Druggists | 1 | 17 | 17 | 7 |
| Midwives | ... | 164 | 164 | 175 |

^aIncludes ophthalmologists.

Source: Abstract of Statistics, Belize 1988.

services provided by health centers; 56.1% have close direct access and 32.5% are served through periodic visits by mobile clinics on a prearranged schedule. Of those with direct access, 92.1% are urban dwellers living in the district capitals or major towns. According to the Ministry's figures, 8.9% of the rural dwellers have direct access to the health centers, 3% have intermittent access, and 24% have no access.

The lack of availability of health professionals is a major

obstacle for the development of health programs. The number of registered health personnel in selected occupations, including those in private practice, is shown on Table 5. Around 50% of the physicians and 30% of the dentists were working for the Ministry in 1987, which is less than the 58% and the 40%, respectively, in 1984. All nurses are employed by the Government, but the number did not increase in the last years despite the annual production by the nursing school.

BERMUDA

GENERAL CONTEXT

Political, Economic, and Social Situation

Bermuda is a member of the British Commonwealth and is governed by a parliamentary system of government. An 11-member cabinet is appointed by the Premier; the Legislature consists of an 11-member senate appointed by the Governor, and a House of Assembly with 40 elected members. The official language is English.

Bermuda has virtually no natural resources, and all energy is imported. The economy is based on tourism and international business enterprises. About one-third of the work force works in wholesale and retail trade, restaurants, and hotels. Another third is engaged in community, social, and personal services. Unemployment is negligible. The economy grew approximately 8% in 1987-1988, with the gross domestic product (GDP) rising to approximately \$US1.3 billion. Annual per capita income is about \$US22,000. Inflation is estimated at around 6% per annum.

Education is free in government schools and is compulsory up to age 16. In 1989, a total of 10,195 children were enrolled in government and private primary and secondary schools. The literacy rate has been estimated at a high of 97%. There is basically one community with no cultural subgroups.

Good housing standards are widespread, although there are some small shortfalls in certain categories. Roads are good, and there is a well developed public transport system (buses, taxis, and ferries). Private car ownership is high, although the Government restricts car ownership to one vehicle per household. Public and private tele-

phones are easily available, and sophisticated international telecommunications have been developed.

Demographic Characteristics

The population was estimated at 58,620 inhabitants in 1988: 20% is under 15 years of age, 9.5% is 65 years and over, and around 57% is over age 21. Annual population growth is approximately 1%; the birth rate in 1988 was 15.9 per 1,000 inhabitants. Population density is 2,840 inhabitants per km².

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

The crude mortality rate in 1988 was 7.5 per 1,000 population. Life expectancy at birth is estimated at 73 years.

The leading causes of mortality in 1983 are shown in Table 1. Cardiovascular disease accounts for more than 50% of all deaths.

Mortality and morbidity patterns have remained the same over recent years. Road traffic accidents have been reduced significantly, as a result of a campaign against drinking and driving, the action of the police against speeding, and heavy fines imposed on violators. Alcoholism was the most common cause of admissions to hospital, followed by respiratory illnesses and accidents.

| Cause | Deaths | Rate |
|-------------------------|--------|------|
| Cardiovascular diseases | 210 | 3.6 |
| Cancer | 85 | 1.5 |
| Respiratory diseases | 22 | 0.4 |
| Accidents and violence | 33 | 0.6 |

Health Situation of Specific Population Groups

Child Health

The infant mortality rate was 3.2 per 1,000 live births for 1988; 93.2% of newborns have a birthweight of more than 2,500 g. Around 90% of children in the 0–5 and 5–15-year age groups have acceptable weight for age. Some obesity is seen in the 5–15-year age group. Nutrition and health education programs are being instituted in primary and secondary schools.

The incidence of diseases preventable by vaccination is low. The incidence of mumps and measles has been considerably reduced through the introduction of the triple vaccine MMR. In 1988, vaccination coverage for children under 1 year was 85% for polio, diphtheria, and whooping cough and only 6% for tuberculosis.

There is a preventive dental care program for infants and children, which provides fluoride treatments.

In 1988 more than 95% of newborn children received health care from birth to at least 1 year of age.

Health of Adolescents and Adults

Accidents are a major public health problem with significant morbidity and mortality, and alcoholism and drug abuse also rank as important public health problems. AIDS and other sexually transmitted diseases also are significant problems. As of 31 December 1988, the cumulative number of AIDS cases reported was 100, resulting in 78 deaths.

Prenatal care was provided to 95% of pregnant women in 1988. All deliveries were attended institutionally or by trained personnel, and 95% of mothers received puerperal care. Immunization coverage of pregnant women against tetanus was 99% in 1988.

Problems Affecting the General Population

Hurricanes during May to November are the only potential natural disasters. In September 1987 Hurricane Emily caused considerable damage to property, and electricity was lost throughout the island. The Emergency Measures Organization responded effectively and recovery efforts were immediately put into place. Obesity is a public health problem. Toxoplasmosis is a zoonosis of national significance.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

The national health policy emphasizes maternal and child health, health of school-age children, community

nursing 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.

The main responsibility of the Ministry of Health and Social Services is the health and welfare of all Bermuda residents. The work of the Ministry's departments of health, social services, and prisons is coordinated and controlled through the Ministry headquarters. 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 Ministerial Joint Planning Committee reviews all major expenditures for public health and social services programs, for prisons, and for hospitals. The budgeting process has been decentralized to more fully involve program managers. There is no central planning agency.

The Ministry of Health and Social Services is responsible for health planning, programming, budget, and evaluation. The Ministry also is 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 Hospital (general) and St. Brendan's Hospital (psychiatric).

In general, the Ministry administers public health clinics, the overall monitoring of food and drug administration in the island, general health care for penal institutions and the police, routine health examinations in the schools and nurseries, environmental health inspection, preventive and educational promotions and reports to the public, immunization programs, quarantine services, and the reorganization of social welfare.

The Department of Health is responsible for the public health, disease prevention, and health promotion services. Different public health service programs are administered through the following sections: personal health services, dental health services, environmental health services, and the public health laboratory. Schoolchildren receive free treatment and persons over the age of 65 receive subsidies of 75%–100% of hospital costs. Installed capacity includes 234 beds in private and semiprivate rooms and public wards, and 90 geriatric and rehabilitation beds at the King Edward VII Memorial Hospital. There are 166 beds at St. Brendan's Psychiatric Hospital, which provides care and treatment for the mentally ill and mentally handicapped. The ratio of beds per 1,000 population was 3.9 in 1988; that year there were 12.6 discharges per 1,000 population.

A significant private sector includes general practitioners and hospital services. Bermuda has compulsory hospitalization insurance; 50% of its cost is borne by employers.

Mental health services are provided through psychiatrists, psychologists, a psychiatric social worker, and mental welfare officers attached to St. Brendan's, the only psychiatric hospital on the island. The hospital complex is currently undergoing renovation and expansion.

Health care is widely available and easily accessible. Referrals are generally directed through private practitioners who have bed privileges in the island's general hospital. There are established links for the provision of tertiary care in the United States of America, the United Kingdom, and Canada.

Committees to coordinate activities and improve the management of the health services have been established; some improvements have been achieved in the evaluation process. The first priority concerning health information is epidemiological surveillance.

In 1988 the ratios of health human resources per

10,000 population were: 11.3 physicians, 4.8 dentists, and 77.6 nurses.

HEALTH AND THE ENVIRONMENT

The entire population is supplied with safe drinking water at home, as well as hygienic excreta disposal. All construction projects must comply with building legislation, particularly with regard to plumbing, sewage disposal, and water supply.

Collection and disposal of solid waste are carried out by the public works department. Incinerator plants are used, and marsh reclamation and landfill measures are ongoing.

There is growing concern over oil pollution of beaches, groundwater pollution by pesticides, and automobile and airplane emissions.

BOLIVIA

GENERAL CONTEXT

Economic, Political, and Social Situation

As international prices declined, Bolivia's economy, which is based on the production of raw materials whose export depends on foreign markets, experienced negative growth every year since 1981, and the country has confronted the worst economic crisis in its history. According to the 1988 World Bank report, per capita GDP in 1987 was \$US580; it had been falling since 1985, although its decline in 1987 was less than in previous years. This was the result of a slight economic recovery (2.15% growth), which was not sufficient to surpass population growth. Inflation, which had reached 276% in 1986, declined to 14.6% in 1987, and then increased to 16% in 1988.

The country's external debt (according to the Economic Commission for Latin America and the Caribbean) increased \$US643 million from 1985 to 1988 (from \$US3.29 billion to \$US3.93 billion). The economic crisis and the adopted recovery measures have affected the lowest social classes. The percentage of nonwage workers increased after a stoppage in the mining industry. The agricultural sector and the mining and petroleum industries declined from 1985 to 1987, in contrast to the manufacturing, service, and commercial sectors, which experienced growth. Unemployment has increased, reaching rates of 18.0% in 1985, 20.0% in 1986, and 21.5% in 1987. In recent years, more women have participated in the work force: in 1986 the number of employed women was 30% greater than in 1976, while the number of men barely increased 1.2%.

Illiteracy affects large sectors of the population: among persons 15 years old and over, illiteracy nationwide was 66.1% in 1983, but decreased to 60% in 1987 (52.2% for men and 67.8% for women). The percentage of children under 15 years old who do not attend school was 52% for males and 42% for females in urban areas, and 63% for males and 67% for females in rural areas.

According to the 1976 census, 76% of dwellings had no more than one bedroom. In 1985, the average number of persons per household in the city of La Paz was 4.09, and there was an average of 2.7 rooms per dwelling, for a ratio of 1.5 persons per room. The nationwide housing

deficit is estimated at 650,000 units (representing 65% of the total number required) and includes units that have not yet been built and the many existing dwellings that need to be improved. It is estimated that in urban areas the housing shortage comes to 220,000 dwellings (56% of the urban total) and that the rural housing deficit is approximately 430,000 units (70% of the rural total). Some 90% of rural dwellings do not meet minimum living conditions, subjecting their occupants to serious sanitation problems and overcrowding.

The consolidation of democracy is currently threatened by the economic crisis, which has led the Government to adopt an economic policy that has stabilized certain economic variables, but also has helped bring about some economic and social deterioration, including a decline in real income, rising unemployment, and reductions in public spending for health and education.

Demographic Characteristics

Tables 1 and 2 show population estimates for 1980–1990. The estimated population for 1985 was 6,371,000, of which 49.3% were males and 50.7%, females. The annual growth rate is high and is estimated to continue increasing. Average annual growth was 2.69% for 1980–1985 and 2.76% for 1985–1990. The age structure of the population for 1985 and 1990 shows a high percentage of children and few elderly. The population under 15 years of age accounts for approximately 43.8% of the total, while those over 60 years old represent only 5.2% of the population.

The process of urbanization continues unabated, and the migration from the countryside to the city is significant. In the early 1980s there were only three cities with a population greater than 200,000: La Paz, Santa Cruz, and Cochabamba. By the late 1980s, the population of the six largest urban centers (La Paz, Cochabamba, Santa Cruz, Sucre, Oruro, and Potosí) accounted for 33% of the country's total population. Other urban areas have at least one of these features: one-half or more of the population works in agriculture or related activities and at least half of the local economy is based on agriculture or its related activities. Bolivia's rural character and its population dispersion constitute some of the country's major population problems.

| Indicator | 1985 | 1990 |
|----------------------------------|-------|-------|
| Total population (in thousands) | 6,371 | 7,314 |
| Men | 3,138 | 3,605 |
| Women | 3,232 | 3,709 |
| Male-female ratio (%) | 97.1 | 97.2 |
| Urban population (in thousands) | 3,046 | 3,759 |
| Percentage of total | 47.8 | 51.4 |
| Rural population (in thousands) | 3,325 | 3,554 |
| Population 0–4 years (%) | 17.4 | 17.3 |
| Population 5–14 years (%) | 26.4 | 26.6 |
| Population 60 years and over (%) | 5.2 | 5.2 |
| Population 65 years and over (%) | 3.2 | 3.2 |
| Women ages 15–49 (%) | 23.2 | 23.2 |
| Average age (years) | 18.0 | 17.9 |
| Dependency ratio (%) | | |
| Total | 88.5 | 89.1 |
| 0–14 years | 82.5 | 83.0 |
| 65 years and over | 6.0 | 6.1 |

Source: United Nations. *World Population Prospects, 1988*. New York, 1989.

The overall fertility rate (Table 2) for 1980–1985 was 6.25 children per woman; the crude reproduction rate is 3 daughters per woman. High mortality, especially in the first years of life, brings this figure down to 2.3 daughters who reach 15 years of age per woman (net reproduction rate). Overall fertility differs in the urban and rural areas (4.84 and 7.41, respectively, in 1985). According to the 1976 census, the highest overall fertility rates were concentrated in the rural areas of the plains (8.8), the Altiplano (7.7), and the valleys (7.8), while for the urban areas in those ecological regions, the rate was 5.17. This rate is much higher in the low-income brackets (7.5) than in the middle- and upper-income brackets (4.4). The high birth rate predominated among the Quechua and Aymará groups. A correlation between illiteracy and the birth rate was found: among women with nine years of schooling, the overall fertility rate was 3.1, while among illiterate women it was 8.0. Fertility was higher among women who did not work.

For 1985–1990, life expectancy at birth was estimated at 53.1 years. The crude death rate, which was estimated at 15.9 per 1,000 population in 1985, and the crude birth rate, which was greater than 40 per 1,000 population, have two significant consequences: 44% of the population is under 15 years old, and there is a major dependency ratio—for every 100 persons 15 to 64 years

| Indicator | 1980–1985 | 1985–1990 |
|---|-----------|-----------|
| Average annual population increase (in thousands) | 160 | 189 |
| Average annual births (in thousands) | 263 | 293 |
| Average annual deaths (in thousands) | 95 | 97 |
| Average annual growth (%) | 2.69 | 2.76 |
| Urban | 4.21 | 4.21 |
| Rural | 1.38 | 1.34 |
| Crude birth rate ^a | 44.0 | 42.8 |
| Crude death rate ^a | 15.9 | 14.1 |
| Overall fertility rate ^b | 6.25 | 6.06 |
| Crude reproduction rate ^b | 3.05 | 2.95 |
| Net reproduction rate ^b | 2.29 | 2.32 |
| Infant mortality rate ^c | 124 | 110 |
| Life expectancy at birth (years) | 50.7 | 53.1 |
| Men | 48.6 | 50.9 |
| Women | 53.0 | 55.4 |

^aPer 1,000 population.

^bPer woman.

^cPer 1,000 live births.

Source: United Nations. *World Population Prospects 1988*. New York, 1989.

old, it is estimated that there will be 89 dependents (those under 15 years old and those over 65 years old) in 1990.

The maternal death rate in 1980 was 48 per 10,000 live births. Infant mortality is high; the rate was estimated at 124 per 1,000 live births for 1980–1985 and at 110 per 1,000 for 1985–1990, although some reports give higher figures and suggest that in the rural areas the rate may be double the figure mentioned. The 1976 census and later surveys have shown regional differences in infant mortality by socioeconomic strata. These regional variations range from 164.2 per 1,000 live births in Potosí to 85.7 in Tarija (1976 census).

The changes in the country's socioeconomic development, the economic crisis, and the search for employment and improved living conditions have triggered major population shifts in recent years. It is estimated that the migratory population has grown from 30,000 in 1950–1955 to 400,000 in 1980–1985. The main migrations are to other countries (it is estimated that 675,000 Bolivians live in neighboring countries, primarily Argentina and Brazil); from the Altiplano and valleys to the plains; and from the rural areas to the cities. This last population shift has led to a growth of marginal urban neighborhoods in the periphery of the principal cities. In addition, there are seasonal migratory movements in search of employment. Approximately 36,000 agricultural workers migrate annually from the Altiplano and the valleys to the plains for the sugar and cotton harvests. Several thousand more go to Argentina to work on the sugarcane plantations.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

The main health problems are cases of infectious, parasitic, and nutritional diseases associated with poverty, an unhealthy environment, and inadequate living conditions. The last years in which mortality was registered by cause were 1980 and 1981. For those years, the official estimate of the National Institute of Statistics showed 30% coverage of registered mortality (i.e., 70% under-registration). Subsequently, coverage declined, and presently only age, sex, and the department where the death occurred are tabulated. As a result, data on registered mortality should be used cautiously, which is why the only data presented here are on proportional mortality by age and causes for 1980 and 1981. Specific death rates by age and cause cannot be derived because the denominators are not available.

Of all deaths in 1980–1981, 25.1% were in children

under 1 year old; 15.4% were in the age group 1 to 4 years old; 3.3% in the age group 5 to 14 years old; 17.4% in the age group 15 to 44 years old; 16.4% in the age group 45 to 64 years old; and 22.4% in the age group 65 years old and older. This breakdown was calculated on the basis of the 55,025 deaths registered in the two years. According to United Nations estimates (Table 2), underregistration of infant mortality is 79%, which means that only one of every five deaths in children under 1 year old are registered. According to that estimate, deaths of children under 1 year old would account for 34.3% of the total, rather than the 25.1% obtained on the basis of registered mortality.

Table 3 shows the proportional mortality from causes for 1980–1981.

Deaths attributed to ill-defined causes represented 15.7% of all registered mortality, revealing problems of quality in certifying the cause of death. Infectious and parasitic diseases; nutritional deficiencies; anemias; respiratory diseases; and complications of pregnancy, delivery, and the puerperium account for 41% of all registered deaths. Given the distortion caused by underregistration, and considering that these five causes are associated with the most underserved groups, especially children, and that the coverage of deliveries is on the order of 30% of all births, it is possible that the real percentage of deaths from those causes is greater than 50%. It is important to point out that two causes alone, intestinal infections (diarrhea) and pneumonia, account for 21% of all mortality. Deaths from traumatism and poisonings account for approximately 10%.

Infant mortality data from the census (1976) and from the Bolivian Consultant on Human Reproduction (COBREH) (1983–1984), indicate that the distribution by cities is quite skewed, with rural and small cities showing higher figures (Table 4). Infant mortality is higher in the Altiplano, the valleys, and the mountains, and lower in both the tropical plains and the larger cities and towns. Other differences are linked to the mother's educational level, the locality's degree of urbanization, socioeconomic strata, quality of housing, and the language spoken by the mother.

Health Situation of Specific Population Groups

Child Health

Studies carried out by the Ministry of Social Welfare and Public Health in 1982 and 1983, in collaboration with PAHO/WHO, established that among the leading causes of death in children under 3 years old were intestinal infections and respiratory infections, which together

| TABLE 3 | |
|---|----------------|
| Percentage structure of registered mortality by causes, Bolivia, 1980–1981. | |
| Cause of death | % ^a |
| Infectious and parasitic diseases (001–139) | 23.9 |
| Infectious intestinal diseases (001-009) | 10.6 |
| Tuberculosis (010-018) | 4.8 |
| Diseases preventable by vaccination (whooping cough, poliomyelitis, diphtheria, yellow fever, measles, tetanus) | 4.7 |
| Streptococcal sore throat, scarlatina, and erysipelas (034, 035) | 1.6 |
| Septicemia (038) | 0.9 |
| Louse-borne typhus (080) | 0.3 |
| Malaria (084) | 0.3 |
| Trypanosomiasis (086) | 0.4 |
| Neoplasms (140–239) | 4.0 |
| Stomach (151) | 0.4 |
| Liver (155) | 0.3 |
| Trachea, bronchia, lung (162) | 0.2 |
| Breast, uterus, and cervix (174, 179, 180, 182) | 0.6 |
| Prostate (185) | 0.1 |
| Leukemia (204–208) | 0.2 |
| Diabetes (250) | 0.5 |
| Nutritional deficiencies (260–269) | 0.1 |
| Anemias (280–285) | 1.2 |
| Mental disorders (290–319) | 1.5 |
| Alcohol dependence syndrome (303) | 0.6 |
| Diseases of the nervous system (320–359) | 1.6 |
| Meningitis (320–322) | 0.7 |
| Epilepsy (345) | 0.2 |
| Diseases of the circulatory system (390–459) | 19.5 |
| Hypertensive disease (401–405) | 0.5 |
| Acute myocardial infarction (410) | 1.4 |
| Diseases of pulmonary circulation and other heart diseases (415–429) | 12.4 |
| Cerebrovascular disease (430–438) | 2.9 |
| Atherosclerosis (440) | 0.8 |
| Diseases of the respiratory system (460–519) | 14.0 |
| Acute laryngitis and tracheitis (464) | 0.5 |
| Acute bronchitis and bronchiolitis (465) | 0.5 |
| Pneumonia (480–486) | 10.1 |
| Influenza (487) | 0.7 |
| Chronic and unspecified bronchitis, emphysema, and asthma (490–493) | 0.9 |
| Diseases of the digestive system (excluding the oral cavity) (530–579) | 8.6 |
| Ulcers (531–533) | 0.2 |
| Intestinal obstruction without mention of hernia (560) | 0.9 |
| Cirrhosis (571) | 1.5 |
| Cholelithiasis and cholecystitis (574–575) | 0.2 |
| Nephritis, nephrotic syndrome, and nephrosis (580–589) | 1.6 |

TABLE 3 (Cont.)

| Percentage structure of registered mortality by causes, Bolivia, 1980–1981. | |
|--|----------------|
| Cause of death | % ^a |
| Complications of pregnancy, childbirth, and the puerperium (630–676) | 1.5 |
| Abortion, hemorrhage of pregnancy and childbirth, and postpartum hemorrhage (630–641, 666) | 0.3 |
| Normal delivery (650) | 1.0 |
| Congenital anomalies (740–759) | 0.5 |
| Conditions originating in the perinatal period (760–779) | 7.4 |
| Slow fetal growth, fetal malnutrition, and immaturity (764–765) | 1.1 |
| Hypoxia, birth asphyxia, and other respiratory conditions (768–770) | 1.1 |
| Accidents, adverse effects, and violence (E800-E999) | 9.8 |
| Motor vehicle traffic accidents (E810-E819) | 1.3 |
| Accidents due to natural and environmental factors (E900-E909) | 0.4 |
| Accidental drowning and submersion (E910) | 0.5 |
| Accidents caused by firearm missile (E922) | 0.5 |
| Suicide (E950-E959) | 0.2 |
| Homicides (E960-E969) | 0.4 |
| Injuries undetermined whether accidentally or purposely inflicted (E980-E989) | 4.3 |
| Other well-defined causes | 4.4 |

^aThe percentages are in relation to total deaths from well-defined causes.

accounted for more than 60% of all deaths in that age group. The importance of tuberculosis as the second leading cause increases considerably beginning at 24 months of age. The third leading cause of mortality is constituted by diseases originating in the perinatal period, which are due to insufficient or lack of maternal care in pregnancy, delivery, and the puerperium.

A study carried out in 1987 among patients attended to at Children's Hospital in the city of La Paz, the prin-

cipal pediatric reference center, established that 44.8% of children who died in the hospital showed some degree of malnutrition. The association between malnutrition and mortality was greater in patients with degree III malnutrition; among such patients, mortality was 3.3 times greater than in those suffering degree I malnutrition, and 4.4 times greater than in those not affected by malnutrition.

The frequency of acute diarrheal diseases has increased in recent years; these diseases constitute the principal cause of morbidity and mortality in children under 1 year old and in preschoolers. It is estimated that a child under 5 years old has 9 to 12 diarrheal episodes each year. In recent years, the incidences of poliomyelitis, whooping cough, and tetanus have diminished in response to the Ministry's emphasis on combating those diseases. However, measles, diphtheria, and whooping cough continue to contribute significantly to mortality in children. In 1988, 1,292 cases of measles and 588 cases of whooping cough were reported. The increase in tuberculous meningitis cases in children under 5 years old that have been reported to the Bureau of Epidemiology in recent years, is noteworthy.

Information on low birthweight is limited and requires further research. For two consecutive years, the Health Unit of Cochabamba reported a percentage of nearly 5% to the Nutritional Epidemiological Surveillance Service, mostly among premature births. In contrast, hospital

TABLE 4

| Infant mortality per 1,000 live births in the main cities, by source, Bolivia, 1976 and 1983–1984. | | |
|--|-------------|-------------------------------|
| City | 1976 Census | COBREH ^a 1983–1984 |
| La Paz | 123.6 | 133.5 |
| Cochabamba | 105.7 | 147.6 |
| Santa Cruz | 95.5 | 135.6 |
| Oruro | 139.1 | 140.9 |
| Potosí | 164.2 | 171.3 |
| Sucre | 121.4 | 108.1 |
| Trinidad | 92.9 | 97.9 |
| Tarija | 85.7 | 82.4 |

^aBolivian Consultant on Human Reproduction.
Source: UNICEF, 1987.

prevalences in La Paz have ranged from 14% to 17% (National Institute of Nutrition-INAN and UNICEF, 1987).

There is chronic malnutrition, especially in early childhood. The prevalence of malnutrition in the age group 1 to 6 years old is considered to be 47% in the rural areas and 57% in the urban areas. Malnutrition is the basic cause linked to 57% of deaths in children under 6 years old.

The fact that the highest prevalences of malnutrition occur in children of weaning age suggests a possible relationship with lactation. In 1982, INAN conducted research in three urban areas to determine the influence of urbanization on breast-feeding. The average duration of breast-feeding found in La Paz was 11.5 months; in Sucre, 10.3 months; and in Trinidad, 9.3 months. Women from the middle and upper social strata breast-feed their children for the shortest duration; among the lower social strata breast-feeding continues for 8.6 months, and in the upper social strata, for 5.5 months. Educational level is another factor for which notable differences were found. Illiterate mothers and those who can only read and write, breast-feed their children for 12.4 months, while those who have more education breast-feed for an average of 5.2 months. In a research paper published by UNICEF (1986) in La Paz, the average duration of breast-feeding was set at 11.1 months.

According to 1981 INAN findings, the most serious nutritional problem is protein-calorie malnutrition. Using height for age with two standard deviations as the cut-off point, it was found that 40.1% of children under age 5 suffered growth retardation, whereas for weight/height, the prevalence was only 0.6%. Using the cut-off points established by Gómez, the weight/age ratio was deficient in 46.5% of the children studied. A research project carried out in 1985 in depressed areas (Avaroa Province of Oruro; Linares and Saavedra provinces of Potosí; and Boeto and Tomina provinces of Chuquisaca) found that 39.9% of children under 2 years old had low height below two standard deviations, and that this figure increased to 64.3% in children 2 to 4 years old.

The main cause of protein-calorie malnutrition is insufficient food consumption. FAO calculated (1985) that availability or "apparent consumption" in 1984 was 2,088 calories, whereas the per capita requirement is 2,232 calories. In general, the surveys carried out show an average caloric intake of 80% of the recommended levels. A study in five different socioeconomic strata in the city of La Paz found caloric intake at 67% of the recommended levels, close to the figure found in another study in Inquisivi (1987), which was 76%. The most significant figures were found in depressed rural areas of Oruro, Potosí, and Chuquisaca, where intake was only 58% of recommended levels (UNICEF, 1984).

The First National Height Census in Schoolchildren of the first grade, carried out by the Nutritional Epidemiological Surveillance System, also showed high prevalences of chronic malnutrition among children 6 to 9 years old, as well as considerable differences in the prevalences of the principal cities. The percentages of children below two standard deviations are: 30.9% in La Paz, 41.2% in Potosí, 25.3% in Oruro, 28.1% in Chuquisaca, 18.9% in Tarija, 13% in Trinidad, 17.6% in Cobija, and 25.1% in Cochabamba. Data for the city of Santa Cruz are not available, but its prevalence can be estimated as between those of Cochabamba and Trinidad. Although the most serious nutritional problem is chronic malnutrition, acute malnutrition is also a problem, especially in the poor regions. Regarding weight for height, one of the above-mentioned research projects found that among children under 2 years old, 4.4% were below two standard deviations, and for children 2 to 4 years old, the figure was 3.3%. Malnutrition is more common in the Altiplano than in the valleys and plains; and in each of these regions the rural areas are more affected than are the urban areas. Analyzed by age group, protein-calorie malnutrition is greater from 12 to 23 months, and increases beginning at 6 months of age.

Health of Adolescents and Adults

Tuberculosis and silicosis beset the adult population. In 1983, according to statistics of the Ministry of Social Welfare and Public Health, pulmonary tuberculosis was the leading cause of death in hospitals. It is assumed that there are 15,000 new cases each year. Although the disease is widespread throughout the country, it is especially concentrated in the mining areas and the eastern plains. Its spread is fanned by poverty and internal migration. In Los Yungas, an area where there is significant migration, it has been calculated that the prevalence of pulmonary tuberculosis is 1.3% (1988). From 1970 to 1976, the incidence of tuberculosis was 222 per 100,000. Silicosis is a serious health problem in the mining areas; it is estimated that there are some 12,000 cases each year.

Accidents constitute another important cause of disease, disability, and death in adult workers. In 1982, 12% of all miners had accidents, as compared to 1% of other industrial workers.

The maternal death rates reflect the severity of the health problems and risks that affect women of reproductive age in Bolivia. The leading causes of death are related to complications of pregnancy and childbirth, such as toxemias, hemorrhages, and abortions. The short intergenetic interval further aggravates the situation.

Problems Affecting the General Population

The ten infectious diseases most reported in 1985 were, in rank order: acute respiratory diseases, acute diarrhea, malaria, scabies, tuberculosis, gonorrhoea, chickenpox, syphilis, mumps, and typhoid fever. In 1985, 104,983 cases of communicable diseases were reported, of which 63% were acute respiratory and diarrheal diseases. This figure is probably underestimated, considering the difficulties of access to health services in rural and marginal urban areas and the shortcomings in the health information systems.

The frequency of malaria has increased in recent years, especially in the northeastern part of the country. A total of 9,774 cases were reported in 1981, and 16,388 in 1984. In 1987, 24,891 positive samples were detected in 115,512 thick blood film samples, and 1,800 cases were detected in Santa Cruz, Bolivia's third largest city. In the last six years, the parasite incidence rate increased from 1.7 per 1,000 in 1981 to 3.7 per 1,000 in 1987. The program faces serious difficulties due to the increase in the number of cases from *P. falciparum* and this agent's resistance to chloroquine; the vectors' reduced vulnerability to the usual doses of DDT and their widespread dissemination; and the lack of resources.

Yellow fever is endemic in some jungle areas and has been detected in Beni, Santa Cruz, Cochabamba, and La Paz. The disease shows seasonal trends. There were 54 cases reported in 1985, 30 in 1986, 23 in 1987, and 12 in 1988.

Plague is endemic and showed a migratory behavior. There are three known foci: in Tarija, Santa Cruz (Vallegrande), and La Paz (Franz Tamayo). After many years during which cases only occurred in La Paz, the focus at Vallegrande, which was thought to have been eliminated, was reactivated in 1987. In 1986, a new focus appeared at Ilumaya (Chulumani), in the department of La Paz, which led to 17 deaths. A major epidemic outbreak of dengue occurred abruptly in the region of Santa Cruz in 1987, affecting 72,530 people. Dengue was the communicable disease with the greatest number of cases having been reported that year; in 1988, 4,867 cases were registered.

Chagas' disease remains a problem in Santa Cruz and Chuquisaca. Chagas' disease is endemic in 60% of the country, an area where 45% of the population lives. The index of household infestation in these sites may exceed 70% (Center for National Studies of Tropical Diseases, CENETROP); from 1979 to 1983, 26% of Bolivia's houses were considered to be infested with triatoma. The most common triatomas are *T. cruzi* and *R. sordida*. In a national survey carried out by the Ministry of Social

Welfare and Public Health (1980–1983), it was estimated that from 30% to 45% of the population at risk may be infected. Chagas' cardiomyopathy was found in 15.6% of this population; the diagnosis stemmed from electrocardiographic disorders.

No cases of Bolivian hemorrhagic fever have been reported in recent years; however, its rodent reservoir has been detected far from its initial focus, in Casarave, 50 km from Trinidad, the capital of the department of Beni. The number of reported cases of cutaneous and mucocutaneous leishmaniasis has continued to rise; in addition, cases of visceral leishmaniasis have been registered among the rural dwellers and agricultural workers of the plains.

Reports of rabies in man persist in La Paz, Santa Cruz, Cochabamba, and Tarija. Human rabies data from recent years show the following figures: 7 cases in 1985, 9 in 1986, 15 in 1987, and 17 in 1988. Both human and canine rabies increased in these years. In 1988, 2,276 cases of rabies in dogs were registered.

Endemic goiter affects 60% to 65% of the population (INAN, 1981 and Ministry, 1983). Its distribution by departments is as follows: Chuquisaca, 74.7%; Santa Cruz, 63.7%; Potosí, 63.2%; Beni, 62.9%; La Paz, 61.4%; Cochabamba, 59.5%; Tarija, 55.3%; Oruro, 54.0%; and Pando, 42.9%.

Iron deficiency anemias constitute another important health problem. In a 1978 study of a sample of 2,036 women aged 15 to 49 years old in the city of Santa Cruz, 35.7% were found to have less than 11 g/dl of hemoglobin. In 1977, CENETROP found that 15% of the children residing in orphanages suffered from anemia.

A 1982 research project on pregnant women and children under 5 years old, conducted by the Universidad Mayor de San Simón and INAN, found that 16.2% of the women and 18.5% of the children were anemic. Higher prevalences were observed in women from the plains (23.3%) and in children from the valleys (26%). Apparently, the population of the Altiplano has lower indices of anemias. However, the quantity of red blood cells in relation to height and the lack of homogeneous criteria for the diagnosis of anemias should be taken into consideration.

There is no agreement that vitamin A deficiency constitutes a major public health problem in the country. In studies carried out in 1985 and 1987, high rates were found in depressed rural areas and in Inquisivi (3.8% and 1.1%, respectively), which suggests that the problem may be serious. And despite the fact that almost no cases of conjunctival xerosis, xerophthalmic scars of the cornea, or Bitot's spots were found, results of surveys and serological tests reinforce the view that the problem exists.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

The country's health sector includes three subsectors with their corresponding institutions: the public subsector, social security, and the private subsector. The public subsector is made up of the network of institutions that come under the Ministry of Social Welfare and Public Health, which by constitutional mandate is responsible for improving the population's health through the formulation, direction, and implementation of a national health policy. The health policy aims at improving the health of three priority groups: children under 1 year old and schoolchildren, pregnant women, and workers (mainly in mining communities).

Through institutional strengthening and enhanced popular participation, the following objectives have been pursued: a) improving the coverage of prenatal and postnatal care; b) establishing free health care for institutional deliveries and protecting the mother against tetanus; c) extending vaccination coverage for children 0 to 5 years old; d) establishing oral rehydration units in all health areas; e) improving the population's nutritional status with preferential attention to pregnant women and preschool and schoolage children; f) strengthening the programs for surveillance and control of tuberculosis and endemic goiter; g) reducing the incidence of tropical diseases, particularly malaria and Chagas' disease; h) improving the population's oral health; and i) addressing workers' health needs, especially those of miners.

The social security subsector is part of the general structure of the Ministry and is dedicated primarily to considering and defining social security standards relating to disease, maternity, occupational risks, disability, old age, and death, as well as to dependents' allowances. Approximately 20% of the country's population benefits from social security health services (1987). In terms of health benefits, social security undertakes mainly curative and rehabilitation activities; its involvement in health promotion and prevention is limited.

Approximately 10% of the population uses private health care services. Within this subsector, nonprofit nongovernmental organizations have become increasingly important; they are linked to different groups such as charities, professional or religious associations, cooperatives, and other groups that receive national and international financing. Most of these organizations have specific health objectives, serve restricted populations, and conduct limited programs. For-profit institutions are accessible only to the middle and upper social strata, which represent approximately 2% of the population.

The use of traditional medicine in the rural and urban populations is a legacy of the country's Quechua, Aymará, and Guaraní heritage. To date, traditional medicine is the most widely available health resource.

In 1958, the health services were regionalized for administrative purposes; for accessibility, 11 health units were established that basically correspond to the country's political and administrative divisions (2 additional health units were established that divided the departments of Beni, Pando, and Potosí). The development of a regionalized national health system has been difficult because the public services network for health protection and recovery is insufficient to meet the health needs of the population and is unevenly distributed in the country. In 1983, the Comprehensive Plan of Activities in Health Areas (PIAAS) began to set more specific terms for regionalization using the primary care strategy. At that time, the health areas emerged as the most basic units for providing comprehensive medical care to a given population. In 1986, efforts began for the medium-term development of the health services using a strategy of institutional decentralization through the strengthening of local health systems (health districts).

The political will to transform health services and benefit the health situation has encountered obstacles such as an excessive centralization of decision-making; scanty public financing for the Ministry of Social Welfare and Public Health's activities; the Ministry's weakness in technical and administrative matters; the low level of efficiency of public institutions; poor coordination among the different levels of the public system of care delivery; imbalances in the distribution of human, material, and financial resources, among regions and between urban and rural areas; duplication of resources and activities among Ministry, social security, and nongovernmental institutions in addressing health problems in specific populations; economic, cultural, and geographical difficulties in gaining access to services, particularly in rural and marginal urban areas; and the low remuneration and deficient education and training of staff in the public institutions.

At least 30% of the population does not have access to basic health services. Changes in the labor structure that have resulted from the economic crisis and from adjustment measures may have further reduced access to health services, especially as the population covered by workers' health insurance shrinks.

Installed Capacity and Production of Services

The Ministry of Social Welfare and Public Health provides outpatient care through a network of institutions made up of the hospital/health centers (with beds for this

purpose), urban health centers (without beds), and rural health centers, which in turn are subdivided into medical posts and health posts, depending on the health resources they have. Outpatient care also is provided in the outpatient service of public hospitals and in emergency rooms.

According to information for 1988, the Ministry has a network of 30 highly sophisticated hospitals and institutes and 120 hospital/health centers, which in some cases constitute district hospitals.

The number of consultations, including those at the various social security funds, totaled less than one per inhabitant in 1984 (4,071,178 consultations for 6,429,226 people). Ministry facilities for outpatient care have significantly increased in the last decade: there were 178 in 1975, 1,132 in 1984 (161 health centers and 971 medical posts), and 1,200 in 1988 (120 hospital/health centers, 250 medical posts, and 830 health posts). Of the health establishments, 58% are in the departments of La Paz, Oruro, Cochabamba, and Santa Cruz; 32% are in Chuquisaca, Potosí, and Tarija; and 10% are in Beni and Pando.

The Ministry, which theoretically should serve 70% of the national population, has 7,422 beds (60% of all beds); 3,089 beds (41.6%) belong to hospital/health centers and are considered as "temporary" beds for the first level of care. There is no adequate system of referral to other levels. In 1988, the distribution of the Ministry's 7,422 beds in the different health units was as follows: La Paz, 1,814; Santa Cruz, 1,882; Cochabamba, 667; Tupiza, 215; Pando, 135; Riberalta, 91; Oruro, 391; Potosí, 318; Chuquisaca, 1,114; Tarija, 411; and Beni, 384.

Bed occupancy in 1983 was 44.7%, a figure explained by several factors such as lack of coordination with the primary health care network; deterioration of the facilities (70% are in precarious condition and rely on obsolete technology); and economic factors that limit access. The breakdown of beds by specialties also is a problem, since it does not reflect regional and local epidemiological profiles.

The social security institutions come under the Bolivian Institute of Social Security (IBSS), a decentralized entity of the Ministry of Social Welfare and Public Health whose services are predominantly urban (90%) and oriented to curative and rehabilitation services. These services are provided to insured workers through their own institutions and through contracts with the private subsector. Outpatient care is offered through outpatient consultation services of the hospitals associated with the various social security funds and through this sector's dispensaries. The network of social security services is made up of 37 hospitals (generally in better physical condition and better equipped than those of the Ministry)

and 59 polyclinics. The social security subsector has some 2,800 beds. Table 5 shows the indicator of beds per insured population.

Bed occupancy is approximately 60% (greater than in the Ministry). This subsystem has some internal coordination under the supervision of the IBSS, but almost none with the Ministry institutions.

Information on the private subsector is limited. The country has about 77 private hospitals with a total of 1,546 beds and an unknown number of physician offices. The nonprofit nongovernmental organizations have played an increasingly important role in primary health care, especially in the peri-urban areas of La Paz, Cochabamba, and Santa Cruz. In 1983, it was calculated that there were approximately 300 such organizations, and that nearly 40% were located in La Paz.

Health Services Technologies

Even though Bolivia does not have a large pharmaceutical industry that produces drugs in the country, several companies repackage drugs for the national market. Currently, there are approximately 8,000 pharmaceutical products available on the market. There is an obvious lack of laboratories to provide quality control of drugs.

Efforts have been undertaken to organize a subsystem for distributing medical and critical supplies, but drugs are not yet accessible to most of the population, partic-

| Department | Insured population | Beds | Ratio |
|------------|--------------------|-------|-------|
| Total | 1,256,401 | 2,700 | 2.2 |
| La Paz | 500,306 | 985 | 2.0 |
| Cochabamba | 167,970 | 370 | 2.2 |
| Oruro | 159,152 | 235 | 2.1 |
| Potosí | 115,392 | 263 | 2.2 |
| Tupiza | 19,310 | 77 | 4.0 |
| Chuquisaca | 40,190 | 173 | 4.3 |
| Santa Cruz | 185,931 | 456 | 2.4 |
| Tarija | 33,734 | 81 | 2.4 |
| Beni | 18,289 | 52 | 2.8 |
| Riberalta | 11,577 | 6 | 0.5 |
| Pando | 4,550 | 2 | 0.4 |

Source: Bolivian Institute of Social Security, 1987.

ularly in rural areas. Among factors that have hindered these attempts are the lack of a clearly defined drug policy, the limited operating capability of the services network, the low purchasing power of the population with the greatest risks and needs, the many drugs of questionable efficacy, and the high cost of the drugs.

A similar situation exists with the medical technology for diagnosis and treatment, since there is no explicit policy for selecting, procuring, using, and maintaining medical equipment. The variety of types and brands makes it difficult to maintain, preserve, and repair this equipment.

Financing of the Health Services

The Ministry of Social Welfare and Public Health is financed by the General Treasury of the Republic (public expenditures), by external assistance donations and credits, and by contributions from users of the services. These sources account for approximately 57%, 30%, and 13%, respectively, of the Ministry's funds. In 1986, however, 31% of Ministry expenditures came from the General Treasury, and donations and credits played an important part in financing health spending. In 1977, public expenditures for health represented 8% of total public expenditures. That same year, the combined health expenditures of social security and the Ministry constituted 2.3% of the GDP. Information concerning the financing of subsectors other than the Ministry is limited, and even for the Ministry the last available data permit only a superficial analysis.

The economic crisis has taken its toll on public spending on health, which, as a proportion of total public spending, increased from 3.1% in 1983 to 3.5% in 1986. External assistance has played an important role in the implementation of the Ministry's health programs: in 1985, a total of \$US7.8 million from bilateral and multilateral organizations was directed to health, and in 1988 this figure was estimated at \$US10.8 million. In 1982-1986, nearly 94% was earmarked for operating expenses, with 70% to 80% of these expenditures used to pay for salaries of Ministry personnel.

Financing for the network of social security services comes from workers and employers. Government contributions are limited to the old age, disability, and death plans. Different social security funds have different benefits plans and sources of financing. Due to the economic crisis, unemployment, failure to pay quotas, and inefficiencies, social security funds have recently declined. A law on dependents' allowances (in goods and money) that benefits pregnant women in delivery and children in their first year was approved in 1987.

No data are available on the finances and expenditures

of nongovernmental organizations, which can use workers remunerated by the Ministry and have many sources of financing, such as direct donations from within and outside the country, user fees, and sales of subsidized drugs. However, it is estimated that the amount that these organizations spent on health equals or is greater than the Treasury's contribution for public health.

Human Resources

The situation of human resources in health in Bolivia is characterized by an insufficient number of professionals and health technicians, uneven geographical distribution of health personnel, inadequate training of these personnel, and low pay, especially in the public subsector.

The most reliable information available is that of the Inventory of Human Resources, carried out in 1983 by the Ministry with PAHO/WHO collaboration. According to this source, the Ministry had 8,705 staff members in 1981: 2,307 (26.5%) were professionals, 281 (3.2%) were technicians, 3,093 (35.7%) were auxiliaries, 989 (11.3%) were administrative staff, and 2,035 (23.3%) were health services personnel. Among the "professionals," which include all Ministry staff with a university degree, 1,183 were physicians, 186 were dentists, and 594 were registered nurses. According to this inventory, 20.5% of the physicians, dentists, and biochemists in urban areas work full-time, and 4.8% hold no other job. Unpublished and unverified information for 1985 places the number of Ministry physicians at 1,730, the number of nurses at 891, and the number of dentists at 119.

In 1981 there were 281 technical personnel at the Ministry: 147 sanitation technicians, 46 x-ray technicians, and 88 laboratory technicians. The Ministry's nursing auxiliaries, who are of vital importance to health services, numbered 2,296. According to other estimates, in 1987 there were 2,715 nursing auxiliaries and 470 technicians.

La Paz, Cochabamba, and Santa Cruz account for more than 64% of all health personnel (including the central level staff). In addition, 76% of the personnel in these three regions are concentrated in urban areas. Preliminary data from the 1987 inventory indicate the same distribution (Table 6). Although no data on the private subsector and social security are available, it can be inferred that the distribution is the same, since both are mainly concentrated in urban areas.

Training deficiencies prepare health personnel for curative care in a hospital setting, rather than for health promotion, prevention, and education. This situation contradicts the Ministry's strategies and policies, which emphasize the development of primary health care services. These shortcomings are affected by factors such as curriculum deficiencies, potential for entering the job

| Type of personnel | Total | Urban | | Rural | |
|----------------------------------|--------|-------|------|-------|------|
| | | No. | % | No. | % |
| Total | 11,028 | 6,685 | 60.7 | 4,343 | 39.3 |
| Physicians | 1,730 | 1,194 | 69.0 | 536 | 31.0 |
| Nurses | 891 | 625 | 70.2 | 266 | 29.8 |
| Dentists | 206 | 87 | 42.3 | 119 | 57.7 |
| Nurse auxiliaries | 2,715 | 1,357 | 50.0 | 1,358 | 50.0 |
| Technical personnel | 470 | 322 | 68.6 | 148 | 31.4 |
| Administrative and service staff | 5,016 | 3,100 | 61.6 | 1,916 | 38.2 |

^aPreliminary data, subject to review.

Source: Inventory of Human Resources. Ministry of Social Welfare and Public Health, 1988.

market, current structure of the services network, shortcomings in continuing education, and an overall shift from work in the public subsector to the private subsector.

Low remuneration of public subsector staff leads to flight of qualified professional and technical personnel to other subsectors. Salaries in the Ministry are below those of other public sectors.

The supply of human resources increased from 1976 to 1984, with annual growth rates of 16.1% for all types of personnel, 12.5% for physicians, 22.3% for paramedics, 11.5% for administrative personnel, and 14.5% for health services personnel. Beginning in 1984, with the Integrated Plan of Action in Health, personnel in the health areas were trained through courses in social medicine, which were intended to expand the technical horizons of health area physicians and to fill primary health care gaps in their academic training. From 1985 onward, these efforts continued with the Program for Health Areas (PAS).

The training of popular health promoters also was initiated. Along with nursing auxiliaries, these health promoters, who are chosen by the community, perform an important role in extending coverage and basic care to isolated communities. By 1989, the Ministry expects to have 10,000 to 15,000 popular health committees (made up of popular health promoters), which will constitute a significant training effort.

HEALTH AND THE ENVIRONMENT

Although from 1985 to 1988 the goals and objectives of the National Plan of Basic Sanitation (PLANASBA)

were amended, only 43% of the population has a water supply and only 30% receives drinking water. Of the urban and rural population, 67% and 12%, respectively, have household water connections (38% for the country as a whole), and an additional 6% and 5%, respectively, have access to water connections (6%). In 1976, an estimated 39% of the total population had household water connections, as compared with 43% in 1988; the coverage of water supply systems for the rural population was estimated at 9% in 1976, and at 17% in 1988.

Only 23.8% of the population has excreta disposal services, and according to the estimates of the Technical Secretariat of PLANASBA, coverage of sewerage and sanitation services in 1988 was as follows: 22% of the urban population and 0% of the rural population (12% of the total population) had sewerage services; 7% and 0%, respectively (4% of the total) had septic tanks; 4% and 10% (7% of the total) had latrines; and 67% and 90% (77% of the total) had no services. This indicates that 2,230,430 urban inhabitants do not have sewerage services and 3,010,000 rural inhabitants do not have facilities for sanitary excreta disposal. Total coverage of the services was estimated at 22% in 1976, and at 23% in 1988.

Only three cities have wastewater treatment facilities. As a result, the basins of several major rivers are highly polluted. The situation is aggravated by the fact that these waters are used to irrigate vegetables.

Deficient basic sanitation, the lack of collection centers and hygienic markets, and the limited development of industry and technology are such that there is a considerable risk of food contamination and spoilage. There are no efficient surveillance and control of sources of production, handling, storage, transportation, and distribution to the consumer.

In the area of workers' health, most workplaces do not meet the minimum requirements for safety, basic sanitation, physical environment, and protection against occupational diseases.

The main problems are insufficient coordination among the institutions involved; unsystematic planning in basic sanitation at all levels; inadequate financial resources; use of available resources in ways that are neither balanced nor subject to the National Plan for Basic Sanitation; unrealistic and inadequate rate structures; and the application of basic sanitation technologies that are not always appropriate for the country.

In the face of the pressing need for resources for the productive sector, the allotment of government funds to the sanitation sector has been one of the lowest. From 1965 to 1987, external contributions covered approximately 77% of investment (a total of \$US165 million; \$11 million in 1987). The negotiation and concession of soft credits (long-term and low interest) made it possible to implement projects and master plans that improved the coverage of these services. However, even with these improvements, it was impossible to fulfill the increased demand.

To try and solve the major environmental sanitation problems, a medium-term effort will attempt to stabilize the management of the entities involved in the sector; to establish autonomous companies; to promote "profitability" in the operation of the companies; to strengthen the national system of manpower training for the sector; to improve the conditions for horizontal coordination and cooperation among the sector's institutions at the national level, and with the agencies involved in external cooperation at the international level; to improve operating and maintenance conditions, rehabilitate existing facilities, and strengthen the companies (the technical-operational system, the commercial system, and the financial-administrative system); to promote community participation and health education; to seek coordination with other community development and primary health care programs in order to achieve optimum community participation; to make adequate use of water resources, based on an enhanced operational control of the systems, a reduction of unaccounted for water losses, and the population's sanitary education; and to prepare and carry out municipal plans for improving all aspects of environmental sanitation.

BRAZIL

GENERAL CONTEXT

Political, Economic, and Social Situation

During 1985–1988, the country, and particularly its health sector, underwent major political and institutional changes. In 1985, a civilian government, elected by the National Congress, came to power. This ended the military control of the Government which began in 1964, and allowed a return to democratic citizen participation in various realms of national life.

From an institutional point of view, the period was mostly devoted to the drafting of the new National Constitution and its promulgation in 1988. This process involved intensive consultation and negotiation with citizens and in the parliament. In 1986, the VIII National Health Conference was held with the active participation of representatives from wide-ranging interests involved in the production and consumption of health goods and services. The Conference, which was preceded by state meetings and followed by other meetings on specific issues, provided a forum for setting the political agenda of the Health Reform.

After that phase of popular consultation, which was also carried out in several sectors, the process focused on the National Constituent Congress. At this stage, under the scrutiny and pressures of the various citizen representatives, parliamentary commissions reexamined the topics under discussion and organized them into chapters, finally promulgating the new Constitution in 1988. This Constitution reflects the contrasts within Brazilian society and outlines some reforms, especially in the social realm.

Regarding the economy, an effort was made to strike a balance among generating new growth, controlling inflation, improving income distribution, and renegotiating the external debt (which totals approximately \$US120 billion). After initial success with the 1986 Cruzado Plan, the economy markedly deteriorated, especially in terms of the formal sector. Despite efforts to adjust economic policy, most of the goals will be tackled by the new Government which will take office in 1990.

There are serious discrepancies between economic and social indicators: the first rank Brazil as one of the top ten economies in the western hemisphere, whereas social indicators come closer to those of less developed coun-

tries. From 1967 to 1973, growth of the gross domestic product (GDP) exceeded 10%, but then the economy contracted, and in 1983 the level was comparable to that of 1978. In 1988, economic growth was negative for the third time in the decade, and the GDP declined 0.3% with respect to 1987.

In 1986 total expenditures of national, state, and municipal governments for social services came to some \$US50 billion, or 18.3% of the GDP for that year. Federal government expenditure in the social sector during the 1980s has been nearly 10% of the GDP. The highest percentage was in 1982. In 1985 and 1986 there were recoveries of 14.6% and 9%, respectively, so that social sector expenditures accounted for 9.3% of the GDP in 1986; this percentage is lower than the maximum reached in 1982 (10.7%).

According to 1984 information, approximately 11 million families (35%) lived in poverty and 4.7 million (15%) lived in extreme poverty. The average per capita distribution of family income was only 0.8 times the minimum wage, a situation aggravated by the larger size of poor and extremely poor families (4.8 members on average) as compared to others (3.7 members on average). In 1985, it was estimated that some 53 million Brazilians (40.1%) lived in poverty (Table 1).

In 1984, the economically active population was 52.4 million (35 million of which were men). The economically employed population numbered 50.2 million (33.6 million of which were men). This population was distributed as follows: 32 million persons employed; 11.7 million independent workers who are mostly underemployed; 4.8 million unremunerated workers; and 1.6 million employers. Of this population, 29.8% works in agriculture, 21.7% in industry, and 16.6% (8.3 million) in services not directly linked to production.

According to the General Register of Employed and Unemployed kept by the Ministry of Labor, urban formal-sector employment grew at an annual rate of 4.9% in 1986 as compared to 1985. The value of the real minimum wage has been declining since 1940; currently, it is somewhat less than half the 1940 value.

Regarding education, 27.1% of the population over 5 years old is practically illiterate; however, this figure varies considerably by region. For example, in the northeast illiteracy is 47.2%; in the southeast, 18.1%; and in the south, 18.2%.

| Per capita family income (in terms of minimum wage) | Families (thousands) | | | Persons (thousands) | | |
|--|----------------------|----------|----------|---------------------|----------|----------|
| | No. | % | % accum. | No. | % | % accum. |
| Up to 1/4 m.w. ^a | 4,692 | 14.7 | 14.7 | 24,444 | 18.7 | 18.7 |
| 1/4 to 1/2 m.w. | 6,374 | 19.9 | 34.6 | 28,728 | 22.0 | 40.7 |
| 1/2 to 1 m.w. | 7,860 | 24.5 | 59.2 | 31,844 | 24.4 | 65.1 |
| 1 to 2 m.w. | 6,462 | 20.2 | 79.4 | 23,872 | 18.3 | 83.4 |
| 2 to 3 m.w. | 2,471 | 7.7 | 87.1 | 8,469 | 6.5 | 89.9 |
| 3 to 5 m.w. | 2,121 | 6.6 | 93.7 | 7,008 | 5.4 | 95.3 |
| 5 to 10 m.w. | 1,404 | 4.4 | 98.1 | 4,477 | 3.4 | 98.7 |
| 10 to 20 m.w. | 484 | 1.5 | 99.6 | 1,370 | 1.0 | 99.7 |
| Over 20 m.w. | 134 | 0.4 | 100.0 | 316 | 0.3 | 100.0 |
| Did not declare income | 214 | — | — | 883 | — | — |
| Total | 32,216 | — | — | 131,411 | — | — |

^aIncludes families with no income.

Source: Brazilian Institute of Geography and Statistics Foundation-National Household Survey Research Project (FIBGE-PNAD/85): special tabulations.

From 1977 to 1984, food consumption diminished 1.94% due to an economic policy that gave priority to food production for export, coupled with the low-wage policy that had been implemented. The food and nutrition programs, although intended to promote a redistribution of income, could not meet the needs of the needy population, especially of the poorest groups. It is estimated that only 33% of the population consumes enough food, and that the vast majority (two-thirds) suffers from some nutritional deficiency.

Demographic Characteristics

According to the 1980 census, the population of Brazil was 119 million. It is estimated that in 1989 it will come to 147 million and that by the year 2000 it will reach 180 million, with an annual growth rate of approximately 2%. In 1980, population density was 14.07 inhabitants per km². The country ranked sixth in population worldwide.

Average population growth, which was 2.4% from 1960 to 1970, has steadily diminished in recent decades. Different regions show different rates of population increase, which are mainly influenced by migration patterns and by the reduction of death and birth rates.

The national population is concentrated in the south, southeast, and in a portion of the west-central region (the more industrialized areas); the more sparsely populated regions have an agricultural economy. In 1980, 50% of the population was concentrated in the southeast. The metropolitan areas of that region, such as São Paulo and

Belo Horizonte, have high population growth rates (nearly 4.5% per year).

In the 1970s the urban population was greater than the rural population, representing 55.92% of the total; by 1980 it reached 67.59%. In 1980, the rural population experienced a negative growth rate (-0.5% annually) for the first time.

The overall fertility rate, which was relatively stable in the 1960s, dropped sharply in the 1970s in all the regions. From 1980 to 1984 this decline sped up as compared to the 1970s, falling from 4.35 children per woman in 1980 to 3.32 children per woman in 1984. Despite the differences between urban and rural areas, fertility diminished in both (3.03 and 5.32 children per woman, respectively). Noteworthy among the factors that explain the reduction of fertility and its regional variations are the regional peculiarities of economic growth; the distribution of wealth in the country; age at marriage; the patterns of industrialization, urbanization, and geographical distribution of the population; the changes in reproductive behavior and in the strategies for reproduction and survival of the population; and the increased use of contraceptive methods among low-income sectors.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

The structure of mortality by age group and by geographical region, as well as its trends from 1980 to 1986, is illustrated in Table 2.

| Regions | 1980 | | | | | 1986 | | | | |
|--------------|------------------|-----|------|-------|----------|------------------|-----|------|-------|----------|
| | Children under 1 | 1-4 | 5-19 | 20-49 | 50 and + | Children under 1 | 1-4 | 5-19 | 20-49 | 50 and + |
| North | 31.7 | 8.1 | 6.5 | 19.3 | 34.4 | 27.1 | 6.5 | 6.6 | 20.6 | 39.2 |
| Northeast | 34.7 | 7.8 | 4.2 | 14.2 | 39.1 | 23.9 | 5.4 | 4.1 | 16.8 | 49.8 |
| Southeast | 20.4 | 3.2 | 3.6 | 19.7 | 53.1 | 13.1 | 1.9 | 3.7 | 21.8 | 59.5 |
| South | 18.2 | 3.4 | 4.3 | 18.0 | 50.1 | 11.7 | 2.0 | 3.8 | 19.0 | 63.5 |
| West-central | 21.5 | 4.9 | 6.1 | 24.7 | 42.8 | 13.9 | 3.2 | 5.9 | 26.6 | 50.4 |
| Total | 24.2 | 4.6 | 4.1 | 18.2 | 48.9 | 16.4 | 3.1 | 4.0 | 20.3 | 56.2 |

^aExcludes unknown ages; the proportions have not been adjusted.

Source: National Division of Epidemiology/National Secretariat of Basic Health Actions (SNABS)/Ministry of Health.

All regions, but especially the most impoverished regions in the north and northeast, show many deaths in children under 1 year old throughout the period. The death rates for persons over 50 years old continue to be low, although from 1980 to 1986 there was an upward trend in that group.

In Table 3 the weight of the category signs, symptoms, and ill-defined conditions is striking (ranging from 8.9% in the southeastern region to 45.5% in the northeast). This shows a serious deficiency in medical services.

Excluding this category, cardiovascular diseases are the leading cause of death. Infectious and parasitic diseases remain among the six leading causes of death in all re-

gions. Accidents and homicides are noteworthy among external causes of death. During the period, motor vehicle traffic accidents caused a 49.6% increase in the years of potential life lost and homicides, 51%.

Health Situation of Specific Population Groups

Child Health

Infant mortality in Brazil has shown a downward trend, albeit with considerable variations by region. Thus, for

| Leading causes | Brazil | Regions | | | | |
|--|---------|---------|-----------|-----------|---------|--------------|
| | | North | Northeast | Southeast | South | West-central |
| Signs, symptoms, and ill-defined conditions | 20.3 | 27.3 | 45.5 | 8.9 | 12.5 | 17.6 |
| Defined causes ^a | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Diseases of the circulatory system | 33.3(1) | 21.7(1) | 27.4(1) | 35.7(1) | 36.8(1) | 29.3(1) |
| External causes | 14.7(2) | 16.9(3) | 15.7(2) | 14.0(2) | 13.9(3) | 22.0(2) |
| Malignant neoplasms | 11.4(3) | 8.5(5) | 7.8(6) | 11.7(3) | 15.2(2) | 9.6(4) |
| Diseases of the respiratory system | 10.3(4) | 8.3(6) | 9.5(5) | 10.9(4) | 10.4(4) | 8.5(5) |
| Infectious and parasitic diseases | 7.8(5) | 19.5(2) | 14.3(3) | 5.7(5) | 5.1(6) | 9.8(3) |
| Certain conditions originating in the perinatal period | 7.1(6) | 11.0(4) | 9.7(4) | 6.4(6) | 5.5(5) | 7.2(6) |
| Other causes | 15.4 | 14.1 | 15.6 | 15.6 | 13.1 | 13.6 |

^aThe numbers in parentheses indicate the rank of the six leading causes. Percentages are based on the total number of deaths from defined causes.

Source: National Division of Epidemiology/National Secretariat for Basic Health Actions (SNABS)/Ministry of Health.

1977–1984, infant mortality was estimated at 116.1 per 1,000 live births in the northeast region and at 39.2 per 1,000 live births in the south. Infant mortality figures from 1979 to 1986 are presented in Table 4.

The causes of infant mortality continue to be causes that can be reduced or controlled: intestinal infectious diseases, diseases preventable by vaccination, acute respiratory infections, malnutrition and anemia, and prematurity. Together, these causes account for more than half of all deaths in this group.

In the north and northeast, deaths from intestinal infectious diseases account for one-third of all deaths. In the south and southeast, they are responsible for 8.8% and 10.4% of all deaths, respectively. The structure of mortality by causes reveals the considerable weight of infectious and parasitic diseases in children under 5 years old (22.1% of deaths in children under 1 year old and 26.9% for children 1 to 4 years old). In the age group 5 to 19 years old, external causes account for more than 50% of all deaths; this group of causes was responsible for 6.6% of deaths in children under 15 years old.

In order to combat diseases preventable by vaccination, a multiple vaccination method was adopted in 1984. National vaccination days were organized for administering polio, DPT, and measles vaccines. While coverage that year was 87.6% nationwide, in the north it barely reached 31.7%. In 1988, coverage with the polio vaccine reached 93% as a result of the national vaccination campaigns. The incidence of confirmed cases of poliomyelitis was 0.1 per 100,000 population; most cases are found in the northeast.

The incidence of tetanus diminished from 1982 to 1988 in the south and southeast; in the northeast it has

remained unchanged. Mortality due to tetanus held steady from 1980 to 1986; 70% of such deaths were among persons over 15 years of age. Neonatal tetanus showed a downward trend that was more pronounced in the south and southeast.

From 1976 to 1981 the average incidence of diphtheria was 4 cases per million inhabitants, while in 1988 it was 0.8 per million (preliminary figure). Of deaths due to this disease, 73.5% are concentrated in children under 5 years old.

The incidence and death rates of whooping cough also declined from 1976 to 1988, particularly in children under 1 year old, which is the age group affected by 78% of all deaths from this cause.

During the same period measles fluctuated in all the states, reflecting the direct effect of vaccination campaigns. It has been impossible to maintain high and even vaccination coverage in the country's 4,000 municipalities. Since 1987, vaccination campaigns were carried out in several states; as a result, the number of reported cases has diminished in the north, southeast, and west-central regions; cases increased only in the northeast, where several epidemics were reported. In 1988, measles vaccine coverage in the south was 87.6%, while in the north and southeast the figures were 39.1% and 58.7%, respectively.

In 1985, in response to the crisis regarding the demand for vaccines and sera, a Program for National Self-reliance in Immunobiologicals was developed, and its goals were set to be reached by 1991. The program's activities involve the recovery and strengthening of institutions, manpower training, and studies for developing new technologies.

Health of Adults

In the age group 20 to 49 years old, mortality due to external causes increased to 40.1% in 1986 (Table 5); the incidence of violence and assaults that results from intense industrialization and urbanization also increased. Among persons over 50 years old, diseases of the circulatory system predominate, accounting for half of all deaths in this age group. As a result of Brazil's epidemiological evolution in recent years, chronic diseases have begun to replace infectious and parasitic diseases as a cause of mortality, even though the latter have yet to be adequately controlled.

Among malignant neoplasms, the most significant among men have been cancer of the respiratory tract and of the stomach; among women, cancer of the genital organs causes one-third of all deaths from neoplasms. Malignant neoplasm of the female breast is more frequent in relative terms in the south and southeast; it is less important in the other regions.

TABLE 4

Infant mortality,^a per 1,000 live births, by geographic region, Brazil, 1979–1986.

| Year | Regions | | | | |
|------|---------|-----------|-----------|-------|--------------|
| | North | Northeast | Southeast | South | West-Central |
| 1979 | 119.3 | 109.6 | 54.9 | 44.5 | 53.6 |
| 1980 | 183.4 | 101.4 | 49.4 | 39.4 | 46.3 |
| 1981 | 89.7 | 90.1 | 47.6 | 33.0 | 44.3 |
| 1982 | 87.1 | 84.4 | 45.8 | 32.3 | 41.1 |
| 1983 | 98.2 | 87.8 | 40.7 | 31.7 | 40.7 |
| 1984 | 95.5 | 87.6 | 44.8 | 33.6 | 37.1 |
| 1985 | 87.5 | 72.4 | 36.8 | 29.8 | 34.6 |
| 1986 | 81.7 | 70.7 | 35.8 | 27.4 | 31.0 |

^aEstimates for the state capitals have been considered.
Source: Becker, R.A. Brazil. Recent trends in infant mortality causes, Brasilia, 1989. Mimeograph.

TABLE 5

Proportional (%) mortality by groups of causes^a and by age groups, Brazil, 1986.

| Groups of causes | Children under 1 | 1-4 | 5-19 | 20-49 | 50 + | All ages |
|--|------------------|------------------|---------|------------------|---------|----------|
| Diseases of the circulatory system | 0.6 ^b | 2.5 ^b | 5.9(5) | 22.0(2) | 51.4(1) | 33.3(1) |
| External causes | 1.1 ^b | 17.4(3) | 58.5(1) | 40.1(1) | 5.4(4) | 14.7(2) |
| Malignant neoplasms | 0.2 ^b | 4.7(4) | 7.0(4) | 9.7(3) | 16.2(2) | 11.4(3) |
| Diseases of the respiratory system | 14.5(3) | 25.1(2) | 6.4(4) | 5.5 ^b | 10.3(3) | 10.3(4) |
| Infectious and parasitic diseases | 22.1(2) | 26.9(1) | 7.8(2) | 5.9 ^b | 3.5(5) | 7.8(5) |
| Certain conditions originating in the perinatal period | 45.1(1) | — | — | — | — | 7.1(6) |
| Other causes | 16.4 | 23.4 | 14.6 | 16.7 | 13.3 | 15.4 |
| Signs, symptoms, and ill-defined conditions | 23.0 | 33.0 | 13.6 | 8.8 | 21.3 | 20.3 |

^aPreliminary data. The numbers in parentheses indicate the rank of the six leading causes.

^bNot among the six leading causes.

Source: National Division of Epidemiology/National Secretariat for Basic Health Actions (SNABS)/Ministry of Health.

Data on morbidity from chronic diseases are limited, and they are usually estimated based on isolated studies. The prevalence of hypertension has ranged from 10.1% to 11.3% in different groups of adults. In São Paulo, prevalence was 18.1% in men and 6.6% in women. The prevalence of diabetes has been 6.8% in persons 30 to 69 years old, and is greater among women.

The risk factors associated with chronic diseases can be inferred from studies conducted in the country that are still being analyzed. Observations on smoking show that men acquire the habit as youths and that the degree of consumption varies with age. Among groups with high consumption levels, it is estimated that 28.4% of men and 13.6% of women smoke between 11 and 20 cigarettes daily, and that 8.5% of men and 20.1% of women smoke more than 20 cigarettes daily. Per capita consumption among persons over 15 years old tripled from 1935 to 1985, despite the fact that anti-smoking campaigns have intensified.

In the age group 15 to 64 years old, obesity is more frequent in women (23.6%) than in men (15.3%).

By the year 2000, life expectancy at birth for Brazilians will be 68.5 years. The elderly population has increased gradually, and projections indicate that the group 60 years old and older will double by the year 2000. This fact will increase medical care costs at all levels, and expenditures will be greater as specific resources become necessary to cover a progressive increase in the incidence and prevalence of chronic degenerative afflictions such as hypertension, neoplasms, and diabetes. It is estimated that 80% of the elderly suffer from some chronic affliction involving multiple pathologies.

Mortality and morbidity in women illustrates this group's health status, and this information has led to some redirection of the activities of health services programs. About 7% of deaths in women occur among women 15 to 49 years old. The seven leading causes of death, by order of importance, are: diseases of the circulatory system (28.8%), external causes (16.7%), malignant neoplasms (15.7%), infectious and parasitic diseases (8.4%), diseases of the respiratory tract (6.7%), diseases of the digestive system (6.3%), and complications of pregnancy, delivery, and the puerperium (5.9%). In general, morbidity shows the same distribution of causes, with an increase in the frequency of diseases of the heart and hypertension, accidents, and occupational diseases. In addition, neoplasms of the cervix uteri and the breast, sexually transmitted diseases, and abortion are important causes of morbidity. Precise data on deaths from abortion are unavailable. It is estimated that during the last five years 80% of deliveries had institutional coverage. In 1980, life expectancy at birth was 63.4 years for women; fertility has declined steadily from 5.76% in 1970 to 3.53% in 1984. The participation of women in the labor market has increased from 18.5% in 1970 to 36.9% in 1981. In absolute figures, there were 18.5 million working women in 1985.

Problems Affecting the General Population

Malaria outbreaks are concentrated in the north, particularly in the Territory of Rondônia. Of total cases

registered in 1981 (197,000), in 1984 (378,000), and in 1988 (565,484), 50% were from Rondônia; this is explained by an intense migration associated with the uncontrolled agricultural expansion and mining. The area that is undergoing long-term eradication—which includes the states of Acre, Amazonas, Pará, Maranhão, and Mato Grosso; the territories of Amapá, Rondônia, and Roraima; and the Tocantins River—had 546,450 cases; 51.7% of the slides examined showed *Plasmodium falciparum*.

In a study on the drug resistance of *P. falciparum* it was concluded that the 4-aminoquinolines continue to be important for controlling morbidity and mortality; the quinine-tetracycline association appears to be an option for the resistant infections; and mefloquine is 100% effective in curing malaria caused by resistant *P. falciparum*. It is estimated that six million persons live in the area with a high risk of malaria infection.

Chagas' disease (American trypanosomiasis) is endemic in 18 states and 2,222 municipalities with a total population of approximately 53 million. The infected population in rural areas is estimated at some four million people (1980 data), and, as a consequence of migration patterns and the rural to urban population shift, the disease is thought to have spread to the cities. It is estimated that in the cities of Rio de Janeiro and São Paulo alone there are almost half a million infected persons, which suggests that not only do traditional control procedures need to continue, but that the medical and social aspects of the problem need to be addressed and the risk of transmission by blood transfusion reduced.

A program is being developed in the country to diminish transmission of schistosomiasis and to prevent the spread of the disease, which is endemic in a wide area that stretches from Rio Grande do Norte to Minas Gerais and exists in isolated foci in certain states, except Santa Catarina. The control program is credited with reducing the prevalence of schistosomiasis, as well as for diminishing the frequency of its serious forms.

An effort has been made to maintain the eradication of urban yellow fever and to reduce the number of cases of jungle yellow fever. In the 1980s (as of October 1988), 177 cases of jungle yellow fever were detected. Dengue epidemics broke out in seven states (Alagoas, Bahia, Ceará, Minas Gerais, Pernambuco, Rio de Janeiro, and São Paulo) as a consequence of the reintroduction of *Aedes aegypti* in 1986, when 47,730 cases were reported. In 1987, 89,394 cases were notified. *Aedes aegypti* has been detected in 11 states of the northeast, southeast, south, and west-central regions, while *A. albopictus* has been reported in the southeastern states. There is a broad-based campaign to control the vectors of these diseases.

In 1988, 24,214 new cases of mucocutaneous leishmaniasis were registered, along with 834 new cases of

visceral leishmaniasis. In all states, activities are under way to control this endemic disease.

The national epidemiological outlook regarding zoonoses has not been determined. Although the number of cases of human and canine rabies declined considerably in some areas of the country, these diseases cannot be considered to be under control. A total of 107 human cases were registered in 1973, 168 in 1980, and 36 in 1988, of which 61.1% came from rural areas.

The increased number of leptospirosis cases is directly related to the typical rainy-season floods in Brazil's state capitals. In 1988 there were 2,005 cases, 1,613 of them in the city of Rio de Janeiro.

The echinococcosis/hydatidosis complex appears to be spreading beyond the state of Rio Grande do Sul, as manifested by the occurrence of autochthonous cases in the north (Rondônia and Acre). Research is urgently needed in order to understand the epidemiological cycle in other regions.

A few cases of taeniasis/cysticercosis complex have been registered in death certificates and hospital records (mainly psychiatric hospitals), but the countrywide situation is unknown.

The number of meningococcal meningitis cases has increased in 19 states, and epidemics have been detected in some municipalities, especially in 1988. From 1976 to 1987 there were an average of 1,709 cases per year, and preliminary data for 1988 indicate 2,541 cases. Since 1979, serogroup B has predominated over serogroups A and C; the last two were previously the most frequent and caused a major epidemic in the 1970s. As a preventive measure, vaccines have been administered during epidemics of serogroups A and C, as well as chemoprophylaxis for the patients' contacts.

AIDS cases are concentrated in the southeast. The municipalities of Rio de Janeiro and São Paulo accounted for 58.6% of the cases. The municipality of Santos in the state of São Paulo has the highest incidence, 456.7 per 100,000 population. The mode of transmission of the 6,421 cases registered from 1980 to the first quarter of 1989, was distributed as follows: 69.7% were sexually transmitted, 20% were transmitted via blood (11.3% were drug users), 14% were by perinatal transmission, and 8.9% were undetermined; 90.9% of all cases were males. Public information agencies have conducted extensive campaigns, especially on sex education.

According to the active register of leprosy cases, there were 239,328 cases as of 31 December 1987, with a national prevalence of 1.7 per 1,000 population. The states of Amazonas and Acre, which have a prevalence of 11.2 and 12.9 per 1,000 population, respectively, have the highest coefficients. The 1987 incidence was 14.2 per 1,000 population; this figure was the highest in the last five years, confirming the disease's upward trend.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

The country's health sector is undergoing major political and institutional reorganizations. With the VIII National Health Conference, held in Brasília in 1986, the social movement for health reform as an alternative to the existing health system began to gain momentum. The concept of health as a right of all citizens, the creation of a decentralized and hierarchical Unified Health System, improvements in the definition of legally established relations between the State and the private sector, and the democratization of society constitute some of the fundamental principles of the Health Reform. The new Constitution incorporated these principles and established the legal bases for the Unified Health System envisioned by the Health Reform.

Currently, the health sector clearly pursues a transition from a privatized care model to one based on equity and social justice. This transition has been gradual, and is not yet apparent in the sector's financing, since the private health services network remains as the material support base for the health services market. However, a trend already shows that private outpatient establishments have grown 2.3% per year, as compared to a growth of 19.3% in the public sector.

The private sector is progressively separating itself from the public sector. In 1978, 67.1% of all private health establishments had signed agreements with the public sector; this percentage dropped to 57.8% by 1984. It is frequently pointed out that the continual reduction of public sector payments for the provision of services is the main cause of the lack of interest in these agreements. In recent years, the legal status of the private establishments has been the criterion on which these agreements have been based.

The percentage of philanthropic establishments that enter into agreements has increased from 69.3% to 72.9% in 1984, as a result of a selective and deliberate public sector policy. This effort began toward the end of the last decade and was strengthened by the agreements on Integrated Health Actions (1984) and by the Unified and Decentralized Health Systems (1987).

The current model, which still predominates, is characterized as follows:

- Uneven access to health services and incompatibility between the population's health needs and the delivery of services. The demand arising from the processes of modernization and urbanization is so great that resources have been inadequately allocated, emphasizing costly

therapeutic procedures. The proportion of federal resources allocated to hospital medical care increased from 13% in 1950 to 85% in the early 1980s. This permitted a threefold increase in hospital coverage during the 1970s, without a corresponding increase in financing measures to control preventable diseases. As a result, much of the population was excluded from both individual and collective health services. Nearly 11% of the urban population and 5.8% of the rural population received hospital care in 1984, with 2.24 and 0.59 medical consultations per person per year, respectively.

- Low productivity of existing resources, high costs, and unsatisfactory quality of the services; low efficiency levels in the services; and difficulties in gaining access to medical care. It is estimated that the public network has an idle capacity of approximately 40% (according to the Planning Secretariat for the First National Development Plan of the New Republic). Of the health centers, only 58% offer home visits; 20% have neither prenatal services nor health care for children. In addition, there is a low rate of notification of communicable diseases, and relatively few basic sanitation actions are carried out.

- Lack of integration and systematization of the programming activities, as well as considerable diversity in the services' production and remuneration. Preventive and collective measures are practically limited to the public sector.

The many different types of health care and of remuneration for services offered by the Ministry of Social Welfare and other public and private health care providers, are largely responsible for the sector's budgetary difficulties and for the inequities in access to health care. The health services' precarious organization causes not only user dissatisfaction, but also dissatisfaction among health professionals and entrepreneurs involved in the sector.

At the VIII National Health Conference (1986), the health problem was raised again and the importance of understanding the health-disease process within the country's social, economic, and political context was reaffirmed. The Health Reform's objective is to steer decisions so that health is viewed as a result of nutrition, housing, education, income, environment, work, transportation, employment, freedom, free time, access to the land, and access to health services. To that end, specific measures have been proposed in the above-mentioned areas in order to attain the desired changes in health and living conditions. The system's reorientation will lead to a redirection not only of medical and hospital services, but also of all health care services by incorporating the epidemiological approach and ensuring that the health services oversee the handling of any health problems that may arise in their respective areas of responsibility. The basic guidelines that have been and are being formulated

for reorganizing the sector, based on the new Constitution promulgated in 1988, are:

- Decentralization and compliance with the principle of federalization. The federal unit (states) becomes the basis for the national health system's organization, and, simultaneously, the role of the municipalities in initiating and executing local actions is expanded.

- Integration. This guideline involves eliminating the multiple authorities in each sphere of government and establishing a single responsibility and authority at each management level of the federal, state, and municipal system.

- Social control and the participation of different civic organizations in the identification of problems, the search for solutions, and the monitoring and evaluation of the services provided. Participation in this way constitutes a mechanism for social control of health problems, and not merely a technical matter.

- Comprehensiveness. Health activities should include collective actions—such as those directed at endemic diseases, communicable diseases, and environmental sanitation—as well as individual and curative medical care activities.

The Health Reform represents a democratic transformation of the national health system that is being carried out at different levels. The first is the political and legal level, within which laws and regulations that serve as the basis for the system's operations have been adopted. The new Constitution established the legal foundation for the Health Reform's principles. Article 196, in the health section, states: "Health is everyone's right and the State's duty; it is to be guaranteed through social and economic policies aimed at reducing the risk of disease and other disorders, and at ensuring universal and equal access to the measures and services for health promotion, protection, and recovery." Other articles underline the public interest of health measures and services; institute regionalization and ranking of health services based on the Unified Health System; prohibit the allocation of public resources for assistance and subsidies to for-profit private institutions; prohibit the sale of blood and blood derivatives; and forbid the direct or indirect participation of foreign companies or capital in health services, with the exception of the cases provided for by law. The Constitution also states that the law will establish the conditions for facilitating the removal of human organs, tissues, and other material for transplant. Finally, the reform will consolidate these health positions set forth in the new Constitution into the law that will regulate the system's operations, the organic law of the Unified Health System; the Executive Branch will draft it, and the law will then be put to a vote in the National Congress. At the same time, the states have constituent assemblies. Some 4,000

municipalities must formulate their municipal organic laws.

The Health Reform's second level of implementation is political and administrative, which involves an institutional reorganization that will provide the framework for the Unified Health System. The changes at this level have quickened since 1982, with the implementation of the Integrated Health Actions. These actions, which were based on an agreement between the municipalities and the Ministry of Welfare and Social Assistance, constituted an attempt to redirect the core of the health sector's financing.

Based on the experience of the Integrated Health Actions, and in order to promote the coordination and decentralization of interinstitutional management, Unified and Decentralized Health Systems (SUDS) were set up in 1987 in each state. The administrative functions of the National Institute of Medical Care and Social Welfare were restricted in all the states and at the federal level.

When functions and resources were transferred to the states and municipalities (some \$US4 million in 1988), the SUDS began an effective decentralization of the health system and drew new participants into the process: the state governors and state and municipal secretaries for health. Efforts focus on the state and municipal health secretariats' political and administrative institutional development. Although the decentralization did not effectively involve the municipalities, the 1988 Constitution established their participation in the system.

Finally, the third implementation level is political and operational, which involves activities and efforts to reorganize the services at the local level through the Health Districts. These districts do not have political and administrative power that could compete with the local authorities; rather, by relying on the municipalities and their strengthened political authority, the Health Districts will fulfill the principles of regionalization, hierarchical organization, and public participation.

One of the main challenges for the Health Reform is to consolidate, in real geographical and demographic terms, the health measures and services that yield benefits and help improve living conditions.

Installed Capacity

In 1987 Brazil had 5,761 hospitals, of which 838 (14.5%) had more than 150 beds; 1,740 (30.1%), from 51 to 150 beds; and 3,183 (55.2%), up to 50 beds. There were 501,660 hospital beds, of which 376,445 were in the private sector and 125,215 in the public sector. They were distributed as follows: 39% in for-profit private health care centers; 36% in nonprofit private centers; and

25% in public health care centers. This shows that only a small portion of the population has access to public hospital care.

The health services network is made up of 30,094 establishments, including public and private entities that provide outpatient and hospital services. The public entities (19,096) represent 63.45% of the total, and the private entities (10,998), 36.55%. The northeast has 40% of all health establishments (11,788), and the southeast, 32% (9,607); the southeast has more establishments for outpatient care. The ratio of beds per 1,000 population is highest in the south (3.66) and lowest in the north (1.90).

Health Services Technologies

The almost 20-year-old Central Drug Agency (CEME) operates in a limited way under the direction of the Ministry of Health and currently distributes a portion of the drugs included on the National List of Essential Drugs (RENAME). The CEME covers approximately 10% of the drug supply for health posts and public hospitals. Of these drugs, 60% (although this percentage is declining) come from the 16 production laboratories that operate under various federal and state governmental agencies; the rest are acquired through bids from private industry.

The official laboratories also directly supply the state and municipal public sector, although their production capability is 3.5% of total pharmaceutical production in the country. The national, state, and municipal governments, on the other hand, account for nearly 30% of the demand.

RENAME includes 378 pharmaceuticals corresponding to 256 active principles or drugs, of which 106 are produced in the country. CEME supports the development of advanced chemistry for raw-material production, the study of the country's abundant medicinal plants, and the promotion of systems for preparing drugs in those official laboratories linked to its production network.

Drugs are produced by an industrial sector that lacks local technology and imports most of its inputs. The isolated activities of some agencies, such as CEME, have hindered the development of a medium- or long-term plan for the health sector. There is no real coordination with other government sectors involved in industrial, financial, and foreign trade aspects, and, consequently, there is no true national policy relating to drugs.

Many pharmaceutical products that are registered and authorized for marketing do not undergo effective health surveillance in terms of their therapeutic need, their pharmacological efficacy, or their quality. There is no adequate information system on drugs that could disseminate data and experiences to health professionals or that could ed-

ucate users by promoting the rational use of such products. Products are promoted without considering their appropriate use and without ensuring the informed action of physicians.

The dynamic sector of the drug industry is controlled by foreign firms: although of the approximately 600 registered pharmaceutical companies, 520 are owned by nationals, of the largest 50, which control nearly 80% of sales, only 10 are owned by Brazilians. The 16 largest national pharmaceutical laboratories account for 11% of domestic sales; they include three state laboratories, which cover 2.5% of sales. Pharmaceutical industry sales are currently around \$US1.6 billion, despite low per capita consumption (\$US11.50 per year). Despite the pharmaceutical industry's degree of development, the drug supply does not fulfill health needs. Most marketed products are inadequately prepared or are inadequate for addressing the most common diseases. Price controls notwithstanding, the general population cannot afford most drugs.

The share of the drug market maintained with public funds accounts for 35% of the total. The domestic industry produces less than 14% of substances registered in the country, and most of this production is in the hands of foreign company subsidiaries operating in the country. Nationally owned companies account for barely 22% of the production of active principles. The total value of domestic production is approximately \$US230 million; in recent years imports of active principles reached nearly \$US350 million (62% of consumption).

Financing of the Health Services

The sources of funds for public spending in health can be divided into three major categories:

a) Resources from the national budget obtained from taxes and other levies collected by the federal government that are basically earmarked for the control of communicable diseases, basic services, and food and nutrition programs. These funds also finance medical and hospital care services under the Ministry of Health, the military ministries, and the Federal District government, as well as maintenance of the university hospitals under the Ministry of Education.

b) Resources from the System of National Social Welfare (SINPAS) which, through the National Institute of Medical Care and Social Welfare (INAMPS), finance the system's medical and hospital services that are contracted from and operated by agreement with Social Welfare.

c) Resources from state and municipal budgets primarily destined to maintain the state and municipal services.

In addition, there are resources from the Fund to Sup-

TABLE 6**Structure of consolidated federal spending on health, by economic nature of expenditure (%), Brazil, 1980, 1982, 1984, and 1986.**

| Nature of expenditure | 1980 | 1982 | 1984 | 1986 |
|---------------------------|-------|-------|-------|-------|
| Overall total | 100.0 | 100.0 | 100.0 | 100.0 |
| Current expenditures | 86.1 | 78.9 | 77.4 | 65.2 |
| Personnel | 16.4 | 18.3 | 16.3 | 21.7 |
| Services of third parties | 63.0 | 55.4 | 56.1 | 36.1 |
| Others | 6.7 | 5.2 | 5.0 | 7.4 |
| Current transfers | 9.5 | 15.7 | 17.9 | 28.4 |
| Intragovernmental | 5.5 | 5.4 | 6.2 | 11.3 |
| Intergovernmental | 1.2 | 6.0 | 6.9 | 10.7 |
| Other transfers | 2.8 | 4.3 | 4.8 | 6.4 |
| Investments | 2.8 | 2.9 | 2.3 | 2.9 |
| Financial investments | 0.2 | 0.1 | 0.0 | 0.0 |
| Transfers of capital | 1.4 | 2.4 | 2.4 | 3.5 |

Source: Institute for Economic and Social Planning/Planning Institute/Coordination of Health and Social Welfare.

port Social Development (FAS) and the Social Investment Fund (FINSOCIAL).

Table 6 shows the distribution of the consolidated federal expenditure in health, by economic category of the expenditure, for certain years from 1980 to 1986. The figures reflect the low rate of investment in the last few years (always less than 3%), which reveals the limited concern for strengthening the federal public network. Current expenditures as a share of total expenditures also fell (from 86.1% in 1980 to 65% in 1986), due to the reduction in spending for third-party services (from 55% of total INAMPS expenditures in 1982 to 41% in 1986). There was a significant increase of current and capital transfers, which resulted from placing priority on using

the installed capacity of the state and municipal services. Table 7 presents the estimates of the state and municipal health expenditures, showing that state and municipal expenditures accounted for approximately 30% of total public spending in 1984 and 1986; the lowest share, in 1987, was due to the considerable increase in federal spending. Although estimated expenditures of states and municipalities do not include health expenditures made by municipalities in the interior (the values of which are insignificant), they do include the significant resources from the social welfare sector, which amount to more than 50% of total public spending (61.7% in 1987). Estimated public spending for 1987 came to Cz351.15 billion (\$US8.93 billion).

Given the lack of reliable data for calculating private expenditure on health care, this figure can be inferred through available indicators such as invoices for the different types of private medical care, which cover approximately 22,400,000 persons (\$US1.85 billion in 1987) and by the declared value of health expenditures by individuals when calculating their income taxes (7,000,000 individual taxpayers). In 1984, the declared value came to Cz1.14 billion (US\$742 million at the 1987 rate). Nonetheless, until 1987 expenditures for health insurance and other advance payment plans were not included in income tax returns. In addition, there are private expenditures of individuals who are not required to declare income taxes, as well as private expenditures on drugs. In any event, despite the insufficiency of available data, the overall expenditure (public and private) on health can be estimated to be at least \$US11.50 billion in 1987.

Human Resources

Beginning in the 1960s, and especially in the 1970s, there was an expansion in health services, as well as an

TABLE 7**Total public spending on health (millions of cruzados^a), Brazil, 1984, 1986, and 1987.**

| Sources | 1984 | (%) | 1986 | (%) | 1987 | (%) |
|---|---------|------|----------|------|-----------|------|
| Federal | 5,909.0 | 71.6 | 57,433.0 | 67.9 | 269,940.0 | 76.9 |
| INAMPS | 4,871.3 | 59.0 | 44,144.0 | 52.2 | 216,588.0 | 61.7 |
| Treasury and other state and municipal ^b | 1,037.7 | | 13,289.0 | | 53,352.0 | |
| | 2,348.5 | 28.4 | 27,143.8 | 32.1 | 81,209.1 | 23.1 |
| State and municipal budgets | 2,348.5 | | 27,143.8 | 32.1 | 81,209.1 | |
| Total | 8,257.5 | 100 | 84,576.8 | 100 | 351,149.1 | 100 |

^aAt the 1987 exchange rate, \$US1 = Cz39.30.

^bExpenditures of the state and municipal capitals. Does not include expenditures of the municipalities of the interior.

Sources: Medical data from INAMPS and P. Faveret, "Estimates for developing a social security organization for the states and municipalities," December 1988.

accelerated growth in the number of health personnel. The population employed in health services (with and without specific training) came to 1,200,000 persons in 1980, as compared to 560,000 in 1970 (during the same period, the economically active population grew 51.7%, and the number of employees in the tertiary sector increased by 79.1%).

Training for health professionals, particularly for those with university training, and most especially for physicians, has increased considerably. However, the intensive use of unqualified and semiquified labor was an important feature of the expansion (in 1980, 82% of the workers in the sector were mid-level and basic personnel). Urbanization and industrialization, with the attendant growth of the tertiary sector, coupled with the role played by social security and the public sector in the context of privatization of public policies and the highly subsidized capitalization of the health sector (through workers' savings), are among the factors considered significant in this accelerated growth.

Some of the characteristics of the work force are: the participation of more young people and women; higher levels of schooling; fewer independent professionals who provide health services; more paid workers in the sector; and a longer work day, the most obvious example of which is the "multiple employment" of physicians.

During the 1980s, Brazil experienced its worst economic recession in recent history (from 1981 to 1983); the recession, however, had few repercussions on the rate of employment in the health sector. From 1981 to 1985, the economically active population increased 3.8% annually, employment in the health sector increased 7% yearly, and the level of formal-sector employment for the economy as a whole diminished more than 6%. The growth of employment in the health sector was due especially to expansion of the public sector and to the increase in services for outpatients.

The unevenness in the distribution of health services

and professionals in the country's different regions constitutes one of the most serious obstacles to the Health Reform. Health manpower is excessively concentrated in the most developed regions of the country and in the state capitals. For example, only 18% of medical school graduates and 14.3% of dentistry school graduates in the country go to work each year in the northeast region, where 28.5% of the Brazilian population lives (Table 8). On the other hand, 60% and 65.4% of these graduates, respectively, are concentrated in the southeast, which has 43.6% of the population.

In some northeast states, such as Piauí and Ceará, there are 0.55 and 0.71 physicians per 1,000 population, respectively, while in Rio de Janeiro, in the southeast, there are 3.15 physicians per 1,000 population (Table 9). This concentration is also observed in the capitals as compared to the municipalities in the interior of the various states. The state capital of Amazonas (north), where 46.6% of the state's population resides, is home to approximately 90% of the physicians registered statewide. Salvador, the capital of the state of Bahia (northeast), has 70.4% of the state's physicians and only 17% of its population. This trend is not restricted to the medical profession. Other categories of health professionals are even more heavily concentrated in the capitals, such as nursing personnel (74%) and nutritionists (85.4%), to cite only two examples.

In terms of the institutional distribution of health manpower, if the growth rates registered between 1980 and 1984 are projected to 1988, the institutions in the public sector would cover nearly 62% of the employment of existing health professionals. Another manifestation of the poor institutional distribution of resources is the excessive concentration of health manpower at the most central levels of administration, given that the network of public establishments linked to the municipalities currently absorbs less than 16% of total employment in health in the public sector, as compared to 46% for the

| Region | Medicine | Nursing | Dentistry | Psychology | Social services | Pharmacy |
|--------------|----------|---------|-----------|------------|-----------------|----------|
| North | 4.2 | 4.8 | 2.4 | 1.8 | 3.3 | 4.1 |
| Northeast | 18.0 | 19.4 | 14.3 | 13.3 | 20.4 | 19.3 |
| Southeast | 60.0 | 53.3 | 65.9 | 69.6 | 56.7 | 48.9 |
| South | 14.6 | 19.0 | 13.9 | 10.8 | 13.2 | 23.6 |
| West-central | 3.2 | 3.4 | 3.4 | 4.6 | 6.5 | 4.0 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Ministry of Education.

TABLE 9**Number of physicians and ratio per 1,000 population in selected states, Brazil, 1986.**

| State | Capital | | Total for state | |
|-------------------|---------|-------|-----------------|-------|
| | No. | Ratio | No. | Ratio |
| Amazonas | 1,107 | 1.37 | 1,254 | 0.72 |
| Piauí | 909 | 1.92 | 1,328 | 0.55 |
| Ceará | 3,357 | 2.12 | 4,164 | 0.71 |
| Pernambuco | 5,240 | 4.07 | 6,949 | 0.96 |
| Bahia | 5,026 | 2.79 | 7,135 | 0.67 |
| Minas Gerais | 7,183 | 3.40 | 15,896 | 1.09 |
| Rio de Janeiro | 30,000 | 5.35 | 40,000 | 3.15 |
| São Paulo | 28,822 | 2.86 | 47,383 | 1.60 |
| Rio Grande do Sul | 6,239 | 4.90 | 12,201 | 1.44 |
| Goiás | 2,235 | 2.42 | 4,154 | 0.94 |

Source: Federal Council of Medicine, Brazilian Institute of Geography and Statistics Foundation (1986); Area of human resource studies, Study Nucleus in Community Health, Federal University of Minas Gerais.

state governments and 38% in the federal network of services.

In 1978 the network of hospital establishments accounted for 82.1% of all jobs in the health services sector, and it is estimated that in 1988 the hospital segment continued to account for more than 60% of the available human resources. Almost 60% of physicians—who constitute one of the largest categories of personnel in facilities that do not offer hospitalization—are employed in the hospital sector, while more than 75% of nursing staff are employed in this sector. The employment of physicians currently accounts for approximately 72% of the demand for high-level professionals in the health services; this figure is quite high, even considering that ten years ago the relative weight of physician employment was even greater (78% in 1976). During the 1970s, nursing auxiliaries (up to first grade education) accounted for 36% of total health sector employment, while in 1988 they represented 24% of the demand. It should be noted that the percentage of employment of persons with mid-level qualifications (corresponding to a second grade education) has increased in recent years. The downward trend in the relative number of auxiliaries in the health team reflects an increase in the participation of nursing technicians, who from 1976 to 1988 increased their share of total employment in the sector from 13.9% to 20.7% of total employment.

Some of the figures shown indicate an expansion in the range of high-level health professionals in the team and an improvement in the education and training of nonuniversity personnel. However, it should be kept in mind that these changes are being carried out cautiously.

The lack of training, low levels of schooling, lack of professional recognition, and extremely low salaries in the sector are some of the most important issues to be dealt with in the context of the Health Reform, and are among the problems that the strategies intend to address as a way to improve the quality and efficiency of the services. Indeed, as of early 1987, 1% of nursing personnel were illiterate and 60% had completed only first grade.

Purchase and sales “contracts” for the health work force are characterized by extreme variability, which, in turn, reflects the significant fragmentation in the sector’s market for services. The status of some professionals is governed by the Consolidation of Labor Laws; others fall under statutes that regulate public and governmental entities; others are self-employed and professionals with private practice; and others work under a system of accreditation or specific authorization from public or private institutions. That diversity of situations and work systems generally has correspondingly varied ways to select and hire personnel and to establish wage levels, working days, degrees of technical qualification, contractual responsibilities, and social security systems; these personnel usually have very different rights and duties.

The discrimination against women and younger groups in the work force is a significant indicator of this situation. For example, the average monthly income of male physicians in 1986 was 17% higher than that of women physicians, according to data from the Annual Report of Social Information of the Ministry of Labor. In addition, the average income of nursing personnel employed (a predominantly female category) was 20% higher among men. Another clear indicator of such discrepancies is the figure on concentration of income in certain professional groups by age. In 1985, physicians 50 to 60 years old declared incomes which totaled, on the average, 28 times the minimum monthly wage, while professionals under 30 years of age declared to have received, on the average, 7 times the minimum monthly wage.

HEALTH AND THE ENVIRONMENT

The country’s different degrees of development and prevailing economic conditions have contributed to an urban growth that has led to a housing shortage affecting between 7 and 14 million persons; this figure will almost double by the year 2000.

The sanitary infrastructure situation in the urban sector is as follows: 91 million inhabitants (88% of the population) have direct water supply services; another 7.5 million (7%) have access to such services; 43 million (42%) have sewerage services; 48.5 million (47%) have access

to some system for disposal of liquid wastes; and 41 million (41%) have excreta disposal and waste management services.

In contrast, in the rural areas those services are deficient and, regrettably, precise data are unavailable. It is estimated that 1.3 million inhabitants (3% of the population) have public water supply services and another 13.2 million (34%) are served by various sources. Some 0.3 million inhabitants (1%) have connections to public sewerage systems and 2.1 million (5%) have some system for excreta disposal.

In general, the coverage and quality of urban services are improving as a result of the preparation of the National Sanitation Plan under the direction of the National Housing Bank and, subsequently, under the Federal Economic Fund.

The country has the necessary administrative and institutional infrastructure, high-level human resources, and the material and industrial resources to provide these services. The main problems and obstacles are the failure to address this area as a priority at the national level, the lack of planning for urban development, the lack of planning to protect water sources, shortcomings in the area of social communication, financial difficulties, and the lack of mid-level human resources.

In the basic rural sanitation subsector very little has been done, especially due to a lack of governmental policies, institutional structures, financial resources, technical personnel, organization, and community participation.

In addition to a low coverage with adequate systems for solid waste management, there are serious local problems caused by toxic solid wastes from industry and hospitals. In general, the main limitations in the sector are the lack of a national policy; of institutional, human, and economic resources; and of technical solutions that are compatible with the economic levels and the levels of development.

At present there is a tendency toward environmental deterioration caused by development and by the sometimes indiscriminate use of natural resources.

Guanabara Bay in Rio de Janeiro receives 20 m³ per second of domestic wastes; only 7 m³ per second are adequately treated. Industrial wastes dumped into the bay contain heavy metals and toxic organic discharges, for example, chromium, mercury, and copper. In São Paulo, the Tieté River carries the untreated liquid domestic and industrial wastes of a metropolitan region with 16 million inhabitants. In the Recife metropolitan area and in the Guaíba watershed in Porto Alegre the condition of the rivers is also critical, due to the indiscriminate dumping of untreated wastes.

Most large urban centers have air pollution levels that are higher than those allowed by national legislation and recommended by the World Health Organization. The metropolitan areas of São Paulo and Rio de Janeiro are the main air pollution sources in the country, followed by Porto Alegre, Belo Horizonte, and Recife; other cities with major air pollution problems include Cubatao and Volta Redonda.

Most air pollution comes from particulates (60%) and nitrous oxide. The country's most important petrochemical centers produce pollutants that are dangerous for health, such as benzene, ammonia, nitrogen, fluoride, and toxic and irritating acid aerosols; in some cases, carcinogens, mutagens, and teratogens also are released.

Noise pollution is also a particularly serious problem in the metropolitan areas. Studies in Rio de Janeiro and São Paulo suggest that these two cities are among the noisiest places in the world. This problem is becoming progressively worse in São Paulo, where some of the population is exposed to levels greater than the limits established in national and international legislation.

Brazil uses 80,000 to 100,000 tons of toxic agricultural products annually, and these make their way into the environment through plants, the soil, transport, rain, and the rivers. Statistics kept by the centers participating in the National System of Toxicopharmacological Information of the Ministry of Health indicate that 30% of the cases attended to involved poisoning by harmful agricultural and domestic products.

Pollution by toxic agricultural products occurs mainly in the intensive agriculture areas in the states of Paraná, Rio Grande do Sul, and São Paulo. In the last five years, in the state of Paraná alone there were nearly 7,500 cases of contamination, resulting in 383 deaths. Cotton processing causes more than 50% of the cases, followed by soybean (9%) and coffee (6%) processing. In 1984, there were 2,300 cases and 144 deaths, representing the highest annual figures to date.

The country's gold mining employs more than 800,000 persons in Rondônia, Roraima, Amapá, Pará, Amazonas, Goiás, and Mato Grosso. According to estimates of the National Department of Mineral Production, the national production of gold is approximately 140 tons annually, and its various processes require the use of 240 tons of mercury. All of the mercury used in the extraction of gold is released into the environment and contaminates water and food. In addition, mercury directly contaminates the miners. Studies done in São Paulo indicate that the concentrations of mercury in the urine and blood of miners are much higher than the limits established in national legislation.

BRITISH VIRGIN ISLANDS

GENERAL CONTEXT

Political, Economic, and Social Situation

The British Virgin Islands (Tortola, Virgin Gorda, Jost Van Dyke, Anegada, and a few other small islands) is a dependent territory of the British Crown. A Governor, who is responsible for security and external affairs, represents the Government of the United Kingdom. The territory enjoys internal self-government.

The British Virgin Islands economy is based on tourism and on services. The gross domestic product (GDP) increased from \$US7,093 per capita in 1983 to \$US9,492 in 1987. The rate of inflation has decreased from 2.5% in 1984 to 1.8% in 1987. Unemployment has been low, and was estimated at 5% in 1987; adult literacy is high at 98%, and all children up to age 15 are enrolled in schools.

Demographic Characteristics

The population increased from 11,890 in 1985 to 12,240 in 1987. The population is young, with 34% under 15 years old and only 5.9% older than 65. The birth rate was 18 per 1,000 population in 1986 and 22 in 1987. The fertility rate was estimated to vary between 79 per 1,000 women aged 15-44 in 1986 and 93 per 1,000 in 1987. Because of the low numbers involved, these changes should be looked at with extreme caution. The percentage of women of childbearing age (15-44 years old) remained at 23% throughout 1985-1987.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

Child Health

From 1985 to 1987, there were 15 stillbirths out of a total of 735 births, representing a stillbirth rate of 20.4 per 1,000 births. Neonatal deaths totaled 16, a rate of 22.2 per 1,000 live births. There was only one post-neonatal death and only one death in the 1-4-year-old age group; both occurred in 1987. Prematurity and res-

piratory distress were the main factors responsible for the infant deaths; gastroenteritis and respiratory infections accounted for most of the pediatric hospital admissions.

The Expanded Program on Immunization (EPI) reached 100% coverage for DPT and polio, 70% for measles, and 80% for BCG. The school health program now includes vision screening, fluoride rinses, and deworming as permanent features; audiometric examination also has been introduced recently.

Health of Adolescents and Adults

Hypertension and diabetes are the main causes of morbidity. The fact that heart disease and cerebrovascular disease rank among the leading causes of death reflects the important contribution of hypertension to mortality. Malignant neoplasms constitute another major cause of mortality. Over the past ten years, the number of deaths resulting from motor vehicle accidents has climbed.

Mental health services are largely confined to the capital, Roadtown; the community nursing service coordinates the various mental health activities. There is no resident psychiatrist.

Only one maternal death was recorded, which occurred in 1987. The proportion of babies born to women under 20 years of age is relatively low (10% to 15%). Antenatal care coverage increased appreciably in 1987 with the introduction of evening antenatal classes; more than half of the pregnant women were enrolled before the twelfth week. There continues to be an active family planning and family life education program. A parent education series and a pilot teen clinic are special features of this program.

Health of the Elderly

The elderly constitute one of the most rapidly growing sectors of the small population. There is, however, little documented information on their health status.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

The provision of public health services comes under the responsibility of the Department of Health of the

Ministry of Health, Education, and Welfare. Policy decisions for the health services are made by the Minister with the advice of the senior technical officers and the Permanent Secretary, who is responsible for the daily administration of the Department. Regarding the provision of government health services, the Minister answers to the Cabinet of Ministers.

The Ministry fosters cooperation between the health sector and other civic groups as part of its effort to mobilize national resources. The health education officer promotes similar collaboration within the health sector and between health and other sectors of the Government.

The Permanent Secretary is the chief executive and accounting officer in the Ministry. The Chief Medical Officer reports to the Permanent Secretary and is responsible for the administration and technical direction of all areas of the health services and is in charge of health personnel management. The Chief Nursing Officer has similar responsibilities for the nursing service. The Department of Health employs six medical doctors; one dentist; sixty nurses, midwives, and assistant nurses; and two public health inspectors.

The Government's policy is to provide comprehensive health care in both public and private sectors, with emphasis on mothers, 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 aimed at improving the health of its members.

The entire population has access to local health care. The government health facilities are: the Peebles General Hospital (50 beds); Roadtown public health clinics; the Geriatric Ward (unopened); the Custodial Infirmary; and eight district health clinics on Tortola and the islands of Anegada, Jost van Dyke, and Virgin Gorda. In addition to government facilities, there is an eight-bed private hospital in Roadtown which offers general, gynecological, and plastic surgery services. This provides a total of 58 acute beds or 5 per 1,000 population.

Primary health care is delivered through the community health services, the casualty department at the Peebles Hospital, the central public health clinics in Roadtown, and the district clinics elsewhere in Tortola and on other islands. A significant proportion of primary health care is delivered through the private practice of medical practitioners. These are estimated to provide about 50% of the total primary health care load.

Secondary health care is provided at the Peebles Hospital, and includes accident and emergency services; inpatient care on general, medical, surgical, and obstetric wards; and diagnostic services. The hospital is staffed by one matron, one assistant matron, ward sisters, staff

nurses, assistant nurses, maids, and one trained nurse-anesthetist.

Tertiary health care is provided by resident and visiting specialists. Many residents, especially the well-to-do, travel to St. Thomas or Puerto Rico to take advantage of the variety of specialists and facilities available there.

There are three resident nongovernment physicians; all government physicians are allowed to engage in private practice. The services of visiting specialists from neighboring territories are also available.

Eight physicians have private practices in Roadtown, three with adjoining pharmacies and another with an x-ray unit. In Virgin Gorda, the resident physician has a private practice at the government clinic.

There is one private dental clinic in Roadtown.

There are three major pharmacies in Roadtown and a shop which sells medical accessories. Two other businesses in Tortola and one in Virgin Gorda supply a variety of medicines.

The only health personnel training which takes place in the British Virgin Islands is for assistant nurses. They enter with a basic school certificate and undertake an 18-month apprenticeship working on the wards. The most successful transfer to nursing schools in the Caribbean, the United States Virgin Islands, or the United States of America, where they undertake a three-year training program for registered nurses followed by one year in midwifery training.

Local training of staff is limited; consequently, the country must continue to rely on overseas institutions. The current high turnover rate is expected to continue, until the number of contract officers is reduced and until there are no incentives for trained local staff to migrate to the United States of America.

HEALTH AND THE ENVIRONMENT

The 36 small limestone islands that comprise the British Virgin Islands provide a coastal environment that attracts tourism. Despite the threat of coastal pollution in Tortola and Virgin Gorda, the territory is becoming increasingly aware of the value of its limited onshore and offshore environmental resources.

Saltwater intrusion and other forms of groundwater pollution pose ongoing challenges to the supply of good quality water. Surface sources are very limited and unprotected, and inadequate public health legislative controls allow raw or incomplete sewage to be discharged from hotels and other tourist facilities into coastal waters, including discharges from a small sewerage system in the downtown area in Tortola and ship discharges into marina waters. Tourist-generated solid waste is another

problem, and disposal in Tortola is by unsanitary dumping. Public storage bins are often areas of major pollution, especially those near marinas or in commercial areas.

These problems reflect a lack of modern environmental health legislation and standards, as well as institutional weaknesses in terms of staffing and budgets which hinder implementation of environmental health initiatives. All of the environmental health initiatives, such as waste management, are influenced by the tourism industry and the growing sensitivities over threats to the coastal environment. Whether it is institutional strengthening, legislative updating, environmental education, or technological de-

velopment, environmental health should benefit from the overall concern for the limited environmental resources of the islands.

There is a vertically structured vector control program which routinely covers the entire territory every two to three months. Larvivorous fish are used in cisterns, while other container types are examined and focally treated with insecticide. Plans to investigate the potential for biological control with the copepod *Mesocyclops aspericornis* are being considered. Intensive fogging and larviciding were carried out in 1988 following the detection of several dengue cases on Tortola.

CANADA

GENERAL CONTEXT

Political, Economic, and Social Situation

Canada is a confederation with a national government, ten provincial and two territorial governments. English is the mother tongue for 61% of the population and French for 24%. During the 1986 census, 11% of the population reported their mother tongue as other than English or French. Nearly 4% of the population reported having more than one mother tongue.

Nearly 4.9 million students were enrolled in primary and secondary schools in 1985–1986. Adult literacy (15 years of age and over with more than a ninth-grade education) for both women and men in 1986 was 83.0%. The number of occupied private dwellings totaled just over 9 million, of which 62.0% were owner-occupied.

Demographic Characteristics

Canada's population in June 1986 was 25,354,640, representing a growth rate of 4.2% over 1981–1986. In 1986, 21% of the population was under 14 years of age and 10.9% was aged 65 and older. Three-quarters of the population lives in urban areas. There are three major metropolitan areas, Toronto, Montreal, and Vancouver, each with populations in excess of one million and a combined population of 7.7 million or 30.5% of Canada's total population. Six other cities have populations of more than 500,000 and a combined population of over four million. The estimated number of live births in 1987 was 369,742, at a rate of 14.4 per 1,000 population; 51% were male. The natural increase rate observed was 7.2 per 1,000 population in that year (Table 1).

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

Overall mortality rates have significantly declined since the early twentieth century. As Canada moved into public

insurance coverage of health care services, specific areas showed further declines.

Canada had a life expectancy at birth of 71.9 years for males and 79.0 for females in 1981. The continued decline in age-specific death rates has resulted in further improvements in longevity. According to preliminary life tables prepared for the 1983–1985 period, average life expectancy has increased by approximately one year for both males and females, reaching 72.9 years for males and 79.8 years for females. The gap between male and female life expectancy has decreased since 1976.

A major reason for the overall increase in life expectancy at birth is the drop in infant mortality. Infant mortality rates declined about 78% between 1953 and 1985, and reached 7.3 per 1,000 live births by 1987 (Table 1). This improvement is due to factors such as better health care before and after birth and to better nutrition and living standards. However, the death rate in recent years remains 20% to 24% higher for male infants than for females.

Another reason for the increased life expectancy is the shift in patterns of mortality causes for diseases that occur

| Item | Number | Rate ^a |
|---|---------|-------------------|
| Live births ^{a,b} | 369,742 | 14.4 |
| Deaths ^b | 184,953 | 7.2 |
| Natural increase ^b | 184,789 | 7.2 |
| Infant deaths ^c | 2,706 | 7.3 |
| Neonatal deaths ^c | 1,679 | 4.5 |
| Post-neonatal deaths ^c | 1,027 | 2.8 |
| Perinatal deaths ^d | 2,987 | 8.0 |
| Maternal deaths ^e | 15 | 0.4 |
| Stillbirths 20 weeks and over gestation ^d | 2,296 | 6.2 |
| Stillbirths 28 weeks and over gestation ^d | 1,584 | 4.3 |

^aLive births adjusted for expected undercount.

^bRate per 1,000 population.

^cRate per 1,000 live births.

^dRate per 1,000 live births and specified fetal deaths.

^eRate per 10,000 live births.

primarily in the older age groups. In 1921, while heart disease and cancer were among the leading causes of death, as they are today, they accounted for just 16% of total deaths; by 1985, this figure had increased to 58% of total deaths. By the same token, infectious diseases such as tuberculosis, which accounted for 15% of total deaths in 1921, diminished to less than 1% of total deaths by 1985. An examination of leading causes of death by age group for 1985 shows that below age 45, accidents are by far the leading cause of death. This is particularly true for males: males aged 5–19 are more than twice as likely to die in accidents as females, and in the 20–44 age range their death rate due to accidents is more than four times as high as that for females.

The total death rate for all causes declined slightly more for males than for females between 1975–1985, which is also reflected in the slight convergence of male and female life expectancies. The greater percentage declines in death rates for leading causes in this period have occurred for cerebrovascular disease, which has dropped by 40% for both males and females, followed by diseases of the heart, where death rates have declined by more than 20% for both males and females. 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, during 1975–1985. Within this category, there has been a dramatic increase in the female death rate from lung cancer, which nearly doubled between 1975 and 1985. Table 1 provides a summary of selected vital statistics.

The major current health problems for Canadians, apart from those which result in death, include arthritis and rheumatism; disorders of back, limbs, and joints; mental disorders; allergies; and dental trouble. The leading causes of hospitalization in 1982–1983 were heart disease, mental disorder, stroke, accidents, and respiratory disease. To significantly improve the health status of Canadians, future emphasis must be placed on reducing risks to health and detecting health problems early. Improvements in the rehabilitation of people afflicted by disease or handicap would contribute to their well-being and quality of life.

Health Situation of Specific Population Groups

Child and Adolescent Health

For infants up to a year old, respiratory diseases accounted for 29% of hospital days and were the leading cause of hospitalization. For children 1–14 years old, the leading causes were respiratory diseases and accidents.

Measles vaccine has been in use in Canada since the mid-1960s, and since the early 1980s all provinces have

stressed measles eradication through immunization and education programs. The rate of reported cases of measles declined sharply in the early 1980s, dropping from 57.7 per 100,000 population in 1980 to 3.8 per 100,000 in 1983. The increase in the rate observed in 1984 indicates that there may be some children with inadequate immunization.

Approximately 302,000 children under the age of 15, or 6% of the Canadian population in this age group, are identified as disabled. This prevalence increases from 4% of those aged 0–4 to 7% among those aged 10–14.

Health of Adults and the Elderly

Below age 45, accidents were by far the leading cause of death in 1985. Males aged 5–19 were more than twice as likely to die in accidents as females, and in the 20–44 age group their death rate due to accidents was more than four times as high as that for females.

Malignant neoplasms were the leading cause of death among females aged 20–44 in 1985, at a rate slightly greater than that for males. Suicide was among the leading causes of death for both males and females below age 45 in 1985, although it occurred much more frequently among males. In the 20–44 age range, for example, suicide was the second-ranking cause of death for males and the third-ranking cause for females; however, the male suicide rate, at 27.1 per 100,000 population, was more than four times as great as that for females.

In the 45–64 age range, diseases of the heart were the most frequent cause of death among males in 1985, while malignant neoplasms were the leading cause among females. Males were much more likely to die of heart disease in this age range than females. While the female death rate for malignant neoplasms was 78% of the male rate, the female death rate for diseases of the heart was just over 30% of the male rate.

Among the Canadian population aged 65 and older, diseases of the heart were the leading cause of death for both males and females in 1985 by a wide margin, followed by malignant neoplasms. Accidents were the fifth-ranking cause of death in this age group, although they accounted for just over 2% of total deaths. The female death rate for malignant neoplasms decreased to about 58% of the rate for males in the 65 and over age group, compared to a level of 80% or greater in the younger age groups.

Childbirth, accidents, and mental disorders are the three main reasons Canadians between 15 and 44 years old are admitted to hospitals. In the 45–64 age group, heart disease leads with 10% of hospital days. Next are mental disorder and diseases of the nervous system. Among the elderly, the leading causes of hospitalization are heart disease, stroke, and respiratory disease.

Among the adult population, 12.8%, representing nearly 2.5 million Canadians, report some level of disability. The rate of disability increases with age, from a low of 3.8% among those aged 15–24 to 38.6% of those aged 65 or over. The most frequently reported types of disability are those related to mobility (such as climbing stairs). Mobility problems are reported by 65% of disabled persons. Difficulties with body movements, such as reaching for things (agility), are reported by 54% of disabled persons. These are followed by hearing and sight disabilities. Uncorrected hearing disabilities are reported by 634,000 Canadians and 331,000 report uncorrected sight disabilities. The most prevalent disabling conditions for adults were diseases of the musculoskeletal system and connective tissue, arthritis and rheumatism, and hearing disorders.

Mental disorders. These disorders treated in psychiatric hospitals and general hospitals on an inpatient basis were responsible for approximately 11 million patient-days in 1982–1983, with psychiatric hospitals accounting for 61% of these days and general hospitals accounting for 39%. During the last decade, the number of patient-days for mental disorders has been increasing in general hospitals and decreasing in psychiatric hospitals. General hospitals are primarily used for short-term intensive treatment of mental disorders, whereas psychiatric hospitals are used for both short- 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 1982–1983, general hospitals reported 155,261 cases diagnosed as mentally ill, whereas psychiatric hospitals reported 34,256 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; whereas in psychiatric hospitals the three most common diagnoses were schizophrenia, affective psychoses, and personality disorders.

Heart disease. In 1982, this cause was responsible for one out of every four deaths. Over the past decade, death rates have been gradually declining. The Canada Health Survey showed that about 800,000 Canadians had heart problems in 1979; over half were working-age persons. It was estimated that heart problems caused 300,000 persons to be restricted in their daily activities and over 100,000 persons to have disability days. Over 250,000 patients separated from hospitals in 1982–1983 were treated for heart disease.

Cancer. One of every five deaths was attributed to cancer; 40% of persons who died from cancer were in

their working years or younger. Over the previous decade the death rate gradually increased due largely to a 50% increase in deaths from cancer of the respiratory system. Over 228,000 patients treated for active or suspected cancer were separated from hospitals in 1982–1983.

Provincial registries reported a total of 82,454 new primary sites of cancer in 1982, representing an increase of 1.9% over the 80,949 cases reported in 1981. (Skin cancers other than melanoma are excluded from the incidence totals due to differences in reporting among the provinces.) Among the provinces, the highest incidence rates were observed in Manitoba, Ontario, and Prince Edward Island. Lung cancer was the most frequently reported site of these new cases (12,428), followed by female breast cancer (10,300). All forms of cancer accounted for 41,964 deaths in Canada in 1982. Manitoba had the highest death rate from cancer, at 195 per 100,000 population; British Columbia had the highest rate of hospitalization for cancer in 1981–1982, at 884 per 100,000 population. Among the major sites of cancer, lung cancer by far caused the greatest number of deaths in 1982, at 10,121 deaths, followed by female breast cancer, at 3,646 deaths. These two sites also accounted for the greatest number of hospital separations. Male prostate cancer was the third-ranking cause of hospitalization for cancer, at a rate of 104 per 100,000 males.

Respiratory diseases. The overall pattern of these diseases has been relatively stable, with a small increase proportionate to the population increase. These diseases strike all ages, although 78% of fatal illness occur after age 65. The average hospital stay is seven to eight days. Nearly twice as many men as women die from respiratory disease, largely due to the much higher male death rate from bronchitis, emphysema, and asthma.

Fatal cerebrovascular disease (stroke). This is primarily a condition of old age, and only 15% of deaths occur before age 65. Deaths among men are more common at earlier ages, but elderly women over age 75 account for a large proportion of deaths from this condition. More men than women are admitted to hospitals, but the days of care provided in hospital for women suffering from stroke exceed those for men by more than 30%.

Accidents and violence. Accidental injuries, poisoning, suicides, and assaults in 1982 resulted in 6,286 deaths and 288,360 persons discharged from general hospitals. Of the deaths, 53% were male and 47% were female, and of the persons discharged from hospitals, 58% were male and 42% female. However, the length of hospital stay was higher for females (15 days) than males (10 days),

resulting in the utilization of 1,854,895 patient days by females and 1,777,418 patient days for males.

Alcohol-related problems. In 1981 there were an estimated 397,000 males and 189,000 females suffering from alcohol dependence syndrome (formerly termed alcoholism). Since 1960, the total number of persons afflicted with this disorder has increased by 157% and, in terms of rates, the increase was 85%. The number of deaths classified as directly attributable to alcohol was 3,063 in 1982, of which approximately 78% were due to chronic liver disease and cirrhosis. Most alcohol-related deaths occur among men and in persons aged 60 and over. Heavy drinkers have an overall mortality rate more than twice as high as a comparable group in the general population with the same age and sex composition. They have particularly high mortality rates from suicide, upper digestive and respiratory cancers, stomach and duodenal ulcers, pneumonia, and accidents.

In 1982, the blood alcohol concentration levels of 75% of individuals involved in the 1,564 driver fatalities in Canada were tested. Of the fatalities tested, 60% showed the presence of alcohol, and 35% had more than twice the legal limit. This situation has remained virtually unchanged since then.

In 1982–1983, the number of cases discharged from psychiatric hospitals and general hospitals with a primary diagnosis of alcohol dependence syndrome and alcoholic psychoses was 28,156, and accounted for 592,959 patient days. Of these separations, 80% were male and 20% were female, with a median age of 47 and 45, respectively. In psychiatric hospitals the median length of stay was 29 days, while in general hospitals it was 6 days.

Notifiable diseases. The rate of reported cases of tuberculosis has continued to decline throughout the 1970s and 1980s; the rate of 8.5 per 100,000 in 1985 was less than one-half the rate in 1971.

Regarding sexually transmitted diseases, the rate of reported cases of gonococcal infections declined from 231.4 cases per 100,000 population in 1981 to 160.6 per 100,000 in 1985, while the rate for cases of syphilis remains about the same as that observed in the early 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 have been exposed to the human immunodeficiency virus (HIV) through sexual contact with infected individuals; a few others were infected through blood products or blood transfusions from donors infected with the virus. Since the first diagnosed AIDS case in Canada in 1979, the annual number of cases rose rapidly to 756 in 1987. The case fatality rate at the end of 1987 was 55.3%.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services System

Under the Canadian constitution, responsibility for the delivery of personal health care services falls under provincial and territorial jurisdictions, except for special groups whose health care falls under federal jurisdiction, such as status Indians living on reserves and armed forces personnel. Provincial and territorial governments share the financing of the health system with the federal government.

Canada's nationwide health insurance plan ensures that every resident receives necessary, prepaid medical care and hospital treatment. Provinces and territories are responsible for health care services based on national standards. These standards include: uniform population coverage under like terms and conditions; reasonable accessibility to insured services; portability of benefit coverage; and public administration of services on a nonprofit basis. Additional benefits may be included in the plans at the provinces' or territories' discretion without affecting the federal/provincial/territorial agreements.

Federal staff regulate food safety and the safety and effectiveness of drugs and medical devices and set standards for air and water quality. Provincial employees, through regional health units, deliver public health nursing programs, regulate drinking water and sewage collection systems, and inspect food service institutions.

Since the federal and provincial and/or territorial governments share responsibility for health, a structure that allows for federal and provincial/territorial consultation and collaboration has been established, and is comprised of the following: Conference of Ministers of Health, Conference of Deputy Ministers of Health and Federal-Provincial Advisory Committees on Institutional and Medical Services, Community Health, Health Human Resources, Mental Health, International Health Affairs, Environmental and Occupational Health, Alcohol and Other Drugs, and AIDS. Subcommittees and ad hoc working groups to deal with subjects requiring more detailed study are established as required.

During the past decade there has been increasing awareness of the importance of health promotion and disease prevention. Concerns for health and well-being now stress responsible health behavior, a safer environment, and patient awareness and participation in health matters, particularly in health care choices. Focus on these factors, as well as a comprehensive review of current programs and policies related to the overall goal of achieving health for all, has paved the way for a reorientation of

health initiatives and has set the stage for the development of new promotion and prevention programs.

In November 1986, at the First International Conference on Health Promotion, held in Ottawa, Canada's strategy document, "Achieving Health for All: A Framework for Health Promotion," was released by the Minister of Health and Welfare Canada. This paper presents three major health challenges: reducing inequities in health, increasing prevention, and enhancing the capability to cope with chronic illness and disability. Three mechanisms to address the challenges—self-care, mutual aid, and healthy environments—are followed by three specific implementation strategies—fostering public participation, strengthening community health services, and coordinating a healthy public policy.

Since the conference, collaboration among federal, provincial, territorial, regional, and municipal governments, as well as the efforts of private, professional, and voluntary sectors of Canadian society, has produced the following public policies and initiatives: National Program to Reduce Tobacco Use, National Program on Impaired Driving, National AIDS Strategy, Seniors Initiative, Healthy Cities Project, and the National Program to Strengthen Community Health.

Intersectoral collaboration for achieving health goals has been strong over the past several years. A few examples include: the announcement by the federal Departments of Health and of Labour and by the Treasury Board of a tobacco policy to strengthen the existing program and include smoking cessation; community consultations followed by the announcement of the Action on Drug Abuse Program coordinated by ten federal departments; the Canadian Environmental Protection Act, which resulted from wide consultation with environmental groups, industry, labor, and provincial governments and which will improve the protection of the public and the environment from industrial chemicals; and the Healthy Cities Project, which involved the creation of a network including the Federation of Canadian Municipalities, the Canadian Institute of Planners, and the Canadian Public Health Association and the creation of a national coordinating office supported by Health and Welfare Canada.

Provincial, regional, and municipal health authorities manage primary health care services such as the provision of safe water and sewage treatment, operate public health programs such as communicable disease surveillance and control and health education programs; provide inspection of food-service establishments; offer home and hospital services to mothers and newborns and school health services such as immunization clinics and preventive care dental clinics. In the province of Québec, for example, local community health centers are involved in activities such as providing referrals to hospitals and to social ser-

vices and assisting in the development of support groups. In many instances, rehabilitation and home care services are also provided by the health authorities as well as by voluntary agencies.

Health departments at all levels rely heavily on voluntary agencies. The annual worth of voluntary work to the health and social services sector is approximately \$Can1 billion. In 1986–1987, Health and Welfare Canada provided sustaining grants in the amount of \$Can2.9 million to more than 51 voluntary organizations to help with their operations and \$Can4.7 million from the Health Promotion Contribution Program to support some 115 community-based projects. In the spring of 1988, Health and Welfare Canada announced a cash contribution to the Canadian Public Health Association to support the new National Program to Strengthen Community Health.

Production of Services

The provinces and territories have developed a number of strategies to provide services to all Canadians, including people living in remote areas. These strategies include flying ambulances and health team services, 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. Secondary and tertiary referral hospitals provide a wider range of specialized and intensive services and are usually located in the larger population centers. 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 ten provinces made fee-for-service payments for 149 million visit services (office, hospital, and home) in 1984–1985, at a rate of just under six services per insured person. In addition, they paid for 1.8 million major and 2.5 million minor surgical procedures. Of an additional 103 million services, close to 70 million were radiology and laboratory services, while the remaining 33 million consisted of obstetrical, anesthetic, surgical assistance, and assorted other diagnostic and therapeutic services. The above total of about 256 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' Compens-

sation Boards, uninsured services, and services provided to uninsured persons.

Of the total fee-for-service payments made by provincial medical care insurance plans, about 41% were made for services provided to male patients. Fee payments per insured person aged 65 and over were just over twice as high as payments made per person under age 65.

Dental services. Canadians spent about \$Can2,200 million on dental care in 1985, slightly less than 6% of total health expenditures. A significant health care development since 1970 has been the growth of dental insurance. Approximately 13.6 million Canadians, 55.8% of the population, were insured by third-party payment schemes in 1982.

Hospital services. Patients spent over 52 million days in public hospitals in the 1985–1986 fiscal year, including more than 8 million days in mental institutions. While the number of days spent in general and allied special hospitals had increased each year since 1978, the number of days spent in mental hospitals for the same period decreased. This was a result of extensive changes in the treatment locations for many mental patients and not of a decrease in the prevalence of mental disorders.

The rate of patient-days in hospital varied by sex and age. In the childbearing years (15–24 and 25–44 age groups), the rate for women was double that for men. In the 45–64 age group, men had the higher rates, most likely because men suffer more heart ailments than women. After age 64, both men and women had a high rate of days of hospital care. Length of stay in hospital also varied by age. Up to 44 years of age, people stayed in hospital for an average of one week. For the group aged 45–64, the average stay increased to 12 days in 1982–1983. Patients 65 years old or older averaged 25 days in hospital at a time.

Installed Capacity

As of 1 April 1988 there were 1,244 hospitals with 176,393 beds, including general and specialty public hospitals, proprietary, and federal. The breakdown is indicated in Table 2.

Health Expenditures

Table 3 provides a breakdown of health expenditures by category as percentage of total health expenditures. In 1987, health expenditures were 8.7% of the gross national product.

| Type of hospital | Number | Beds |
|--|--------|---------|
| Total—All hospitals | 1,244 | 176,393 |
| Public—Total | 1,096 | 170,366 |
| Public, General | 841 | 128,288 |
| Non-teaching—Total | 787 | 92,613 |
| Non-teaching with no long-term units | | |
| Total | 438 | 29,815 |
| 1–24 Beds | 168 | 2,508 |
| 25–49 Beds | 122 | 3,980 |
| 50–99 Beds | 66 | 4,556 |
| 100–199 Beds | 41 | 5,635 |
| 200–299 Beds | 22 | 5,177 |
| 300 + | 19 | 7,959 |
| Non-teaching with long-term units | | |
| Total | 349 | 62,798 |
| 1–49 Beds | 76 | 2,508 |
| 50–99 Beds | 94 | 6,899 |
| 100–199 Beds | 63 | 8,810 |
| 200–299 Beds | 39 | 9,697 |
| 300 + | 77 | 34,884 |
| Teaching (excluding pediatric) | 54 | 35,675 |
| Public, Specialty | 35 | 5,658 |
| Pediatric | 8 | 2,663 |
| Psychiatric (including alcohol-drug) | 15 | 1,657 |
| Other ^a | 12 | 1,338 |
| Rehabilitation (including convalescence) | 21 | 2,721 |
| Extended care (including chronic) | 116 | 20,093 |
| Psychiatric long term | 22 | 13,403 |
| Nursing station, outpost | 61 | 203 |
| Proprietary | | |
| Proprietary—Total | 55 | 3,418 |
| General | 3 | 234 |
| Rehabilitation extended care | 45 | 2,722 |
| Psychiatric | 3 | 342 |
| Other | 4 | 120 |
| Federal | | |
| Federal—Total | 93 | 2,609 |
| General ^b | 3 | 234 |

TABLE 2 (Cont.)**Number of operating hospitals and their approved bed complement, by type of hospital, Canada, April 1, 1988.**

| Type of hospital | Number | Beds |
|------------------------------------|--------|-------|
| Psychiatric | 3 | 344 |
| Nursing station, outpost and other | 75 | 454 |
| Other | 12 | 1,577 |

^aIncludes specialties, for example: oncology, cardiac, neurological, orthopedic, and respiratory diseases.

^bIncludes one extended care hospital in Québec.

TABLE 3**Percentage distribution of health expenditures by category, Canada, 1980 and 1986-1988.**

| Expenditure category | 1980 | 1986 | 1987 | 1988 |
|---------------------------------------|--------|--------|--------|--------|
| Institutional and related services | 54.1 | 50.9 | 51.6 | 50.9 |
| Hospitals | 41.0 | 38.6 | 39.4 | 38.8 |
| Other institutions | 11.9 | 10.6 | 10.5 | 10.3 |
| Other | 1.2 | 1.7 | 1.7 | 1.8 |
| Professional services | 22.0 | 23.3 | 23.3 | 23.6 |
| Physicians | 15.1 | 16.3 | 16.4 | 16.6 |
| Dentists | 5.7 | 5.7 | 5.6 | 5.6 |
| Other | 1.2 | 1.4 | 1.4 | 1.4 |
| Drugs and appliances | 10.8 | 12.7 | 13.0 | 13.5 |
| Drugs | 9.0 | 11.5 | 11.8 | 12.5 |
| Other | 1.8 | 1.2 | 1.2 | 1.0 |
| Other health expense | 13.1 | 13.1 | 12.1 | 11.9 |
| Capital expenditure | 5.4 | 4.9 | 4.5 | 4.4 |
| Other | 7.6 | 8.1 | 7.5 | 7.5 |
| Total health expenditure ^a | 22,719 | 43,900 | 46,000 | 50,400 |

^aIn millions of Canadian dollars.

Source: Policy, Communications, and Information Branch, Statistics Canada.

Research and Technology

Funding for basic and applied biomedical research, carried out for the most part in universities and teaching hospitals, and for applied health research, including the development of Canada's health care system, is provided by the federal and provincial governments, by nongovernmental organizations, and by the private sector. Research in the universities consists mainly of investigations into the biochemical and physiological bases of health and disease, whereas scientific research in hospitals con-

centrates 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. Strategies for utilization of appropriate technology are generated through the medical profession, the hospitals, and the provincial colleges of physicians and surgeons; they are formulated by Health and Welfare Canada.

Human Resources

The number of active civilian physicians, including interns and residents, increased at a rate far exceeding population growth. There was an increase of almost 33% in the number of physicians, while the population grew 11.4% from 1975 to 1985. Table 4 provides the number of active physicians in 1975 and in 1988 and their ratio of population per physician. One problem facing Canadians today is the distribution of physicians, not only geographically but 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: they support undergraduate and postgraduate students for guaranteed income and provide location grants and on-the-job training in rural areas.

The number of active dentists has increased at an even greater rate than physicians in relation to the population. In 1975, Canada had 8,738 dentists (1 for 2,619 persons); the total in 1985 was 13,027 dentists (1 for 1,958 persons). Nurses represent about two-thirds of all human resources in health. In 1987 there were 241,759 registered nurses in Canada, with 210,773 of them employed and an additional 10,000 to 12,000 seeking employment. The number of licensed pharmacists in 1985 was established at 18,813, which represents one pharmacist per 1,356 people.

The federal/provincial advisory committee on health manpower provides an ongoing flow of information on the number and types of health specialists in the country.

TABLE 4**Number of active physicians and population per physician, Canada, 1975 and 1988.**

| Type of physician | 1975 | 1988 |
|---|--------|--------|
| All physicians | 39,104 | 57,405 |
| General practitioners & family physicians | 16,379 | 26,079 |
| Specialists | 16,182 | 23,627 |
| Interns & residents | 6,543 | 7,699 |
| Persons per physician | 580 | 451 |

CAYMAN ISLANDS

GENERAL CONTEXT

Political, Economic, and Social Situation

The Cayman Islands is a British Crown dependent territory. Once a dependency of Jamaica, the islands opted for Crown Colony status when that country became independent from the United Kingdom in 1962. The territory is governed by a Governor, a twelve-member legislative assembly, and a seven-member (four elected and three appointed) executive council. The Governor represents the United Kingdom, presides over the legislative assembly, and heads the executive council; each member of this latter body is charged with administering a particular government portfolio.

The territory comprises three islands spanning a total of 250 km²: Grand Cayman, the largest island and the site of the capital, George Town; Cayman Brac; and Little Cayman. The islands are connected by air transportation.

The islands have been politically and economically stable. The economy has grown, mostly from a thriving banking industry, followed by an insurance industry, tourism, and construction to support commercial, residential, industrial, and tourism enterprises.

Efforts have been pursued to diversify the economy, to expand trade between the Cayman Islands and the United States of America, to carry out planning activities for long-term development over a 20-year period, and to establish realistic 5-year development programs for the various sectors. Within this context, a national health plan will be developed.

The Government's budget for 1989 was \$US123 million, with 8.2% allocated to the health sector. The gross domestic product (GDP) for 1987 was \$US395 million, with a per capita GDP of \$US15,860.

Primary and secondary education is free for Caymanians, and there is a nominal tuition fee for non-Caymanians. The Government subsidizes private education in the islands. Adult literacy is estimated at 95%.

The Government has been concerned with environmental protection. Some important new developments include planning marine parks to preserve marine life, establishing a turtle hatching farm, constructing a sewerage system in Grand Cayman, and developing a public water supply system for George Town.

Demographic Characteristics

The estimated population of the Cayman Islands in 1988 was 24,900, of which about 94% lives in Grand Cayman. Of the total population, 8.6% is under 5 years of age and 23.8%, under 15 years of age (1988). Women of childbearing age comprise 27.0% of the population.

Population growth per annum (1979 to 1988) is estimated at 4.9%. A significant factor in the population growth is the number of non-Caymanians admitted to residence. By the end of 1988 non-Caymanians comprised 37% of the resident population.

The general fertility rate in 1988 was 54 per 1,000 women. The birth rate was 15.8 per 1,000 population in 1987 and 15.3 in 1988. Life expectancy at birth is 74.5 years, based on 1983 calculations.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

The crude mortality rate per 1,000 population was 6.1 in 1986, 4.5 in 1987, and 4.4 in 1988. There was one infant death in 1987 and two in 1988, all of them neonatal.

The leading causes of death in 1988 were malignant neoplasms, ischemic heart disease, cerebrovascular disease, accidents, and pneumonia and influenza. Diseases of the heart, malignant neoplasms, cerebrovascular disease, and accidents accounted for nearly 70.5% of deaths during the period 1984–1988. There is continuing concern with the high death rate due to traffic accidents.

Diabetes and hypertension are important causes of morbidity, with one of every four clinic patients suffering from one or both conditions.

Health Situation of Specific Population Groups

The proportion of children under 12 months of age immunized against DPT and polio is 93% and 95%, respectively. Approximately 99% of the target population

has been reached with MMR and 86% with BCG vaccination (1988).

AIDS and other sexually transmitted diseases are receiving more attention. By April 1989, there were 13 HIV seropositive, including four AIDS cases; two deaths had been reported. In 1988 the reported incidence of syphilis per 1,000 population was 3.7; the reported incidence of gonococcal infection per 1,000 population was 4.5.

Mental health and drug and alcohol abuse problems are of increasing concern. Facilities and services in these areas are still inadequate.

Care for the elderly is among the health priorities.

There is also a growing problem with teenage pregnancies. About 18% of women who delivered in 1988 were younger than 20 years of age, with 1.3% being under 16 years of age. There were no maternal deaths in the period 1986–1988.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Both government and private physicians provide health care, with the Government assuming the leading role. The Health Services Department is responsible for all government health care, including the public health and hospital services. The Government operates the 52-bed Cayman Islands Hospital (excluding 8 beds at the Pines Retirement Home for the chronically ill) and the 12-bed Faith Hospital in Cayman Brac.

The public health service has two divisions. One administers the community health service, provides primary care through the district health centers, and handles other functions specified in the public health laws. These programs are supervised by the Medical Officer for Health. The other division covers environmental health concerns and is headed by the Chief Environmental Health Officer.

District clinics offer routine nursing care, maternal and child care, antenatal care, family planning services, immunization, health education, genetic counseling, and home visits. The dental service operates a clinic at George Town Hospital on Grand Cayman, one at Faith Hospital on Cayman Brac, and clinics at six schools in Grand Cayman.

Medical technology improvements have been emphasized. More effective screening programs have been introduced, such as those for diabetes control, for the detection of visual defects among schoolchildren, and for AIDS control. In addition, patient and community education efforts, including activities for drug abuse control and for the control of sexually transmitted diseases, have been intensified.

In 1988 the Cayman Islands had six health centers (four district health centers, one maternal and child health cen-

ter in Grand Cayman, and a clinic in Little Cayman), two hospitals, and two school health centers. That same year, there were 2.9 beds per 1,000 population, 14 physicians per 10,000 population, 3.6 dentists per 10,000 population, and 4.8 nurses and midwives per 1,000 population.

The health service is available equally to all the people of the islands, but the Government focuses efforts on school-age children, civil servants and their immediate relatives, the indigent, and the physically and mentally handicapped.

HEALTH AND THE ENVIRONMENT

The environmental health division continued to emphasize improved rodent control, water quality surveillance, meat and food inspection, monitoring of food handling establishments, and solid waste management. Close coordination was pursued with agencies responsible for improving water supplies and sewage disposal and for the application of building standards.

Grand Cayman has two piped water supply systems, both fed by desalinated water; these systems provide water to approximately 2,000 connections, about 45% of the island's population. The Water Authority, a statutory body, supplies the George Town area using waste heat from the electrical power company to distill seawater; the demand for connections to the George Town system is increasing rapidly. The Water Authority also operates two groundwater developments. A private company has been granted a contract to supply water to the main resort area using high-temperature vapor compression distillation. Several larger apartment buildings and hotels operate small reverse osmosis plants. Many homes collect and store rainwater in concrete cisterns and utilize yard wells for nondrinking water. Private water truckers transport water from the Water Authority Works to supplement individual rainwater supplies.

Cayman Brac and Little Cayman have no public water supply, and residents rely on rainwater catchment and yard wells. Three of the hotels operate small reverse osmosis plants, and the Water Authority has several public handpumps tapped into a small groundwater resource. Some residents rely on imported bottled water for drinking purposes, although the quantity of water imported for this purpose is declining.

The water quality monitoring program has indicated improvements. In 1988, of the 1,670 water samples tested, 25% of samples from cisterns and 38% from wells had fecal contamination. No contamination was detected in the piped water supply systems.

The Water Authority recently has completed a central sewerage and sewage treatment works to serve the West

Bay Beach area, the most densely populated and the major tourist area. By law, properties that fall within the drainage area must connect to a public sewerage system; all properties within the West Bay Beach area were connected under the civil engineering contract granted to the private company. The system incorporates several lift stations and waste-stabilization ponds. It is intended to reuse the treated effluent for irrigation. At this time a salinity problem exists, caused by a number of hotels using salt water for flushing. This problem is presently being addressed by the Water Authority, and it is likely that treated effluent will be provided to the hotels to replace the seawater presently used. All other sewage treatment and disposal is carried out on a site-by-site basis, utilizing septic tanks with deep well injection or soakaway. Larger apartment and office buildings and hotels outside the public sewerage system's drainage area operate some package treatment plants. There is evidence that the on-site treatment and disposal of sewage is a severe threat to the pollution of yard wells.

Grand Cayman's clean and healthy environment testifies to the island's good, comprehensive solid waste management service. Solid waste management, the core of environmental health activities, includes curbside refuse collection, distribution of commercial and community refuse containers, derelict vehicle removal, litter col-

lection, street sweeping, and maintenance of the public beach and facilities. Some 500 tons of solid waste are generated weekly, and disposal is through a landfill. Space problems and insufficient cover material have hampered operations, which has led to groundwater pollution by leachates. The polluted water is being cleaned up, and there are plans to acquire land until other disposal techniques are selected.

Some air pollution problems have been identified; the environmental health section and the owners of the pollution sources are jointly working to solve them.

Food protection is mainly the responsibility of the environmental health division. Three officers routinely inspect sanitary conditions and water quality in restaurants and other food handling establishments; they also examine animals destined for local consumption before and after slaughter.

The planning, water, and health departments approve subdivisions and new developments. The safety of sanitary conditions and waste disposal methods is assured through the application of the building code, which requires better local plumbing and waste disposal practices, certification and licensing of plumbers, and approval of sanitary arrangements. The planning department is developing its building control unit to deal with illegal developments, especially those with substandard housing.

CHILE

GENERAL CONTEXT

Political, Economic, and Social Situation

By the end of the 1980s, Chile readied itself to become the last South American country to return to a democratic government: after 16 years of military government, the Republic's 150-year-old tradition was restored. During those intervening 16 years, the country underwent far reaching structural changes that altered the public sector administration and redefined the role of the State. In fact, the State recast its "subsidiary" role, limiting its intervention to those areas that lacked adequate economic incentives for private sector participation.

The changes in social services represent an important aspect of this process. These changes followed two approaches: first, some services were provided through direct contracts with the private sector and, second, services were decentralized at the municipal level. Another politically significant factor involved a redefinition of the characteristics of the population that benefited from social spending. Chile had embarked on this process of structural reforms before the Region's economic deterioration began. Social expenditures were channeled to certain specific activities designed to provide services to high risk groups and to finance the transfer of services to the private sector. (This expenditure covers the severance pay for personnel that would no longer provide these services in the public sector, as well as costs to transfer well functioning facilities.)

By 1986, all these changes were under way, thus opening up important possibilities in the provision of services to the population. This fact, coupled with the social effect of "purely economic" measures implemented in the course of the decade, led to a significant containment of social demands. This situation is particularly crucial, given that Chile is one of the Region's countries where the State's involvement in the provision of social services has been greatest, and where the population has traditionally participated in the country's political life.

The last quadrennium witnessed a "political space" in the military Government that culminated in December 1989, in the election of a center-left candidate as president, who took office in March 1990. The 1980 Constitution replaced the 1925 Constitution. The October

1988 plebiscite offered citizens the following two options: to approve the presidential candidate proposed by the military Government, who would serve an eight-year term, or to reject this candidate and opt for free presidential elections to be held in the coming months. The presidential term with the second option would be for four years. More than 95% of the electorate participated in the plebiscite, and the second option was chosen. During the subsequent months, the country lived through an intense, free, and well informed electoral campaign in which the three contending candidates had full media access. The Government and some segments of the opposition worked together to smooth the transition to democracy. Some constitutional reforms were approved and a Central Bank Board of Directors, made up of economists that endorsed the new Government's positions, was established. The latter is considered a crucial step, since the outgoing Government had granted total autonomy to the Central Bank, and this institution's Board of Directors potentially could have hindered the incoming economic team's economic plans.

The economy continued to grow for the sixth consecutive year. However, during the first half of 1989, the country experienced a strong but uncontained economic growth that, although it continued to help reduce unemployment, also led to inflation, with rate increases from 11% in November 1988 to 18% in August 1989. During the second half of 1989, economic officials undertook measures to curb this economic expansion, and it is estimated that the GDP increased by 8.5% and the per capita GDP increased by 6.7%. Throughout the 1980s, the GDP increased by 27.5%, while the per capita GDP increased by 9.6%, offsetting the drastic drop sustained early in the decade. In 1987, per capita GDP was \$US2,213 (1986 dollars), and in 1988 the increase was estimated at 5.3%. This growth was due mostly to the marked recovery of the terms of trade, to an increase in exports, and to the increase in copper prices, all of which led to a significant accumulation of foreign reserves.

The rate of inflation, which had remained at approximately 20% annually from 1983 to 1988, was 12.7% in 1988. Real wages have risen; they are estimated to be approximately 100.9% of the figure for the base year, 1980, due to a strong recovery of 6.7% in 1988. In recent years, there has been a progressive reduction of unemployment, both nationally and in the greater Santiago

area. The employed work force in the last third of 1987 was four million; Table 1 shows its distribution by economic activity sectors and the contribution of each sector to the GDP.

The value of exports rose 24% in 1984 and 32% in 1988, and imports increased 21% in 1988 and 30% in 1989, as a result of a significant increase in the GDP during the first half of the year. National and foreign investment capital increased 26% in 1987. From 1986 to 1987, private consumption declined 5% and public sector consumption, 2%. The external debt increased up to 1986, when it reached \$US20.72 billion; in 1987 it began to diminish, and by late 1989 it stood at \$US16.61 billion.

The country is divided into 13 political-administrative regions, which, in turn, are subdivided into provinces and municipalities. The regions constitute decentralized administrative areas; municipalities have some autonomy; and mayors are designated by the President of the Republic.

According to the 1982 census, 91.2% of the population knew how to read and write. By 1990, this indicator had risen to 95%. The population has completed an average of nine years of formal education. In 1986, there were 3,275,320 students enrolled at the various educational levels: 6.4% in pre-primary education, 0.9% in special primary education, 63.6% in regular primary education, 18.4% in secondary education, 4.3% in technical secondary education, and 6.4% in higher education. In 1986, almost all 6 to 13 year olds were enrolled in primary school, while 61% of 14 to 17 year olds were enrolled in secondary school.

The country has 21 universities and 23 higher-education institutes, from which 26,981 professionals grad-

uated in 1986. In the 1980s, university education was no longer free, as a result of concerted efforts to channel social expenditures. Education expenditures were funneled to primary education and to finance structural reforms for the transfer of educational facilities from the central level to the municipalities. The cost of university education prevented some of the poorest segments of the population from enrolling, but student loans are contemplated to help alleviate the problem.

The country's welfare system comprises three insurance branches: the pension plan (old age, disability, and survivorship); the health services plan; and the accidents and occupational diseases plan. The first two are funded by workers' quotas, with no employer contributions, that include compulsory quotas for dependent workers and voluntary quotas for self-employed workers. The quota payment is 12% of the wages for the pension regimen and 7% for the health system regimen; the latter can be increased an additional 2% by the worker. Both are administered by official agencies or by for-profit private associations. The official sector plays an important role in the health plan through the National Health Fund (FONASA), but has limited participation in the area of pensions. The accidents and occupational diseases plan is financed with employer contributions to which are added a minimum of 0.85% of the payroll payments and a percentage that increases according to risk. It is administered by the State or by private nonprofit associations.

According to the 1982 census, the country had 2,522,369 dwellings, 83% of which were urban. The increase between censuses was 35.6% over 12 years. In that period, the average number of residents per dwelling fell from 5.06 to 4.78. There is a housing deficit, particularly for the low-income population, estimated at 423,316 units. In 1982, the percentage of inadequate dwellings because of poor construction or insufficient services reached 15.7%. In 1982, 65.0% of all dwellings were occupied by their owners.

Demographic Characteristics

In 1990, Chile's population, according to projections of the last census in 1982 (INE-CELADE), slightly exceeds 13 million. Population growth between censuses (from 1970 to 1982) was 1.55% annually.

The population's geographical distribution clearly shows an urban concentration in the metropolitan area of Santiago (where 39% of the population lives), Valparaíso-Viña del Mar, and Concepción. The regions with sparse populations are in the far south, and lesser densities are to be found in the southern region and in the far north. The rural population continues to decrease; the 1982 census indicates that the rural population accounted

TABLE 1

Distribution of economically active population and contribution to GDP of principal sectors of the economy, Chile, 1987.

| Economic activity sector | % of population employed | % GDP generated by each sector |
|--------------------------|--------------------------|--------------------------------|
| Agriculture and fishing | 20.8 | 10.2 |
| Mining | 2.0 | 8.4 |
| Manufacturing | 15.1 | 22.1 |
| Construction | 5.2 | 6.2 |
| Others | 56.9 | 53.1 |

Source: National Statistics Institute, 1988 Statistical Compendium, Santiago, 1988.

for 17.8% of the total, which reflects the significant urbanization. The main cities are surrounded by poverty belts called *callampas*. According to studies on family income, 45% of all households are living in poverty. This is a much argued issue among analysts of Chile's social policies, and different studies cite figures between 30% and 45%. Those who endorse the lower estimates believe that the State's provision of social services helps improve living conditions, and, consequently, lowers the percentage of households at the poverty level. However, experts agree that the past few years' economic growth has been coupled with an erosion in the equitable distribution of income.

Distribution by age shows a young population: one-third of the total is under 15 years old, approximately 15% is older than 50 years, and 5.8% is older than 65 years. The male-female ratio is 97.5:100 for the country as a whole, 92:100 for urban areas, and 118:100 for rural areas.

The birth rate, which from 1959 to 1962 was moderately high (37 per 1,000 population), declined to 22 per 1,000 in 1983–1987. Underregistration, as estimated by CELADE, is 11%. Overall mortality has progressively declined, reaching 5.6 per 1,000 in 1987. In 1983–1987, the annual natural population increase was 1.6 per 100 population. Overall fertility was estimated at 2.8 for 1980–1985 and 2.4 for 1987. The rate by age group has decreased in recent years, especially for the population over 35 years old. No significant differences in the birth rate have been observed among the different regions.

Regarding the population's ethnic breakdown, most of the population is of Spanish descent, followed by descendants of other European immigrants (Italians, Germans, Yugoslavs, French, etc.), and those whose ancestors migrated from the Middle East (Palestinians, Syrians, etc.). There are Mapuche indigenous minorities in the south and Atacama indigenous minorities in the north. Migration to other countries is of little significance.

If current demographic trends hold, the health problems of youth, adults, and the elderly will gain importance and will require a change in the traditional approach to health care.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

The quality and coverage of birth and death certifications are satisfactory, as is the registration of morbidity, although this coverage is not as good. In 1987, 91% of the deaths were medically certified; 8% were attributed to ill-defined causes.

Life expectancy at birth for 1985–1990 is estimated at an average of 71.5 years (68.3 years for men and 75.3 for women), which represents an increase of six years from 1970–1975.

Overall mortality moderately declined throughout the last ten years, with a rate of 5.6 per 1,000 inhabitants in 1987. From 1979 to 1987, mortality by age decreased in all age groups; the decline has been significantly greater among children, which means that this age group's proportional contribution to the overall mortality also has dropped.

The geographical distribution of mortality shows the highest rates in the area covered by the Metropolitan Central Service, with 7.1 per 1,000 population, followed by Valparaíso, Ñuble, and Araucanía, which have a rate of 7.0 per 1,000. Urban mortality is slightly greater than rural mortality; women in rural areas show the lowest rates in the country.

The same ranking of causes of death held from 1982 to 1986: diseases of the circulatory system were in first place, with 28% of the total, followed by malignant neoplasms (17%) in second place, external causes (12%) in third place, and diseases of the respiratory tract (11%) in fourth place. Diseases of the digestive system (7%) ranked fifth (chronic diseases of the liver and cirrhosis of the liver accounted for more than 50% of mortality in this last group of causes).

The leading cause of years of potential life lost before the age of 65 is the category of traumatismos and poisonings, followed by certain conditions originating in the perinatal period and diseases of the respiratory tract. In the last five years studied, infectious and parasitic diseases, which accounted for 6% of the total in 1979, decreased to 3.7% in 1987.

A comparison of the principal causes of death among the country's 13 regions shows that diseases of the circulatory system account for 32.7% of mortality in eastern Santiago and in the Magallanes Region, 19.9% in the province of Osorno, and 18.3% in the Llanquihue-Chiloé-Palena area. The proportion of deaths attributed to ill-defined causes ranges from 1.1% in eastern Santiago to 26.9% in Llanquihue-Chiloé-Palena.

Health Situation of Specific Population Groups

Child Health

Trends in infant mortality show significant declines, from 47.5 deaths of children under 1 year old per 1,000 live births in 1977 to 18.5 per 1,000 in 1987 (Table 2). Twenty years ago infant mortality represented more than one-third of total mortality, 20% in 1975, and only 7%

TABLE 2**Deaths of children under 1 year old and rate per 1,000 live births, Chile, 1977-1987.**

| Year | Deaths | Rate |
|------|--------|------|
| 1977 | 11,429 | 47.5 |
| 1978 | 9,169 | 38.7 |
| 1979 | 8,825 | 36.6 |
| 1980 | 8,072 | 32.7 |
| 1981 | 7,082 | 27.2 |
| 1982 | 6,428 | 23.4 |
| 1983 | 5,785 | 21.8 |
| 1984 | 5,182 | 19.6 |
| 1985 | 5,105 | 19.5 |
| 1986 | 5,220 | 19.1 |
| 1987 | 5,182 | 18.5 |

from 1983 to 1987. This reduction is mainly due to a decrease in fertility, to the professional care of pregnancies and deliveries, and to the broad coverage of child care programs, including the program for the control of healthy children (control of growth and development). The main component that contributed to this reduction

is late infant mortality, especially deaths from diarrhea, acute respiratory infections, and malnutrition.

The decline of infant mortality is closely tied to the educational level of the Chilean population, especially to changes in women's levels of schooling: in 1960, 90.7% of mothers had completed at least primary education and 9.3% had not been to school; in 1980 these figures were 97.3% and 2.7%, respectively.

In 1987, the leading causes of infant mortality, in descending order of importance, were certain conditions originating in the perinatal period, congenital anomalies, respiratory infections, accidents, and infectious and parasitic diseases; 4% were attributed to ill-defined causes. Of infant deaths, 84.0% are still considered preventable, in particular those due to anoxia of newborns.

It has not been possible to compare the mortality rates of different socioeconomic groups or those of residents of marginal urban areas. Table 3 shows overall death rates for the population and mortality rates of children under 1 year old in the country's regions and in their respective provinces. In the Metropolitan Region (Santiago) a comparison by socioeconomic level in the residential municipalities shows that in the western area, which has the most poverty, infant mortality is 17.8 per 1,000, and in the eastern area, which is better off, it is 11.8 per 1,000 live births.

TABLE 3**Overall death rate per 1,000 population and infant mortality rate per 1,000 live births, by region, Chile, 1987.**

| Region | | Overall mortality | Infant mortality |
|------------------------------------|--|-------------------|------------------|
| National total | | 5.6 | 18.5 |
| I. | Tarapacá | 4.1 | 12.4 |
| II. | Antofagasta | 5.2 | 18.7 |
| III. | Atacama | 5.0 | 21.9 |
| IV. | Coquimbo | 5.5 | 28.8 |
| V. | Valparaíso | 6.2 | 18.1 |
| VI. | Libertador General Bernardo O'Higgins | 5.8 | 18.8 |
| VII. | Maule | 6.2 | 21.7 |
| VIII. | Bío-Bío | 5.8 | 22.5 |
| IX. | Araucanía | 6.8 | 32.5 |
| X. | Los Lagos | 6.4 | 26.1 |
| XI. | Aisén del General Carlos Ibáñez del Campo | 5.1 | 29.1 |
| XII. | Magallanes and Chilean Antarctic | 5.1 | 17.5 |
| Metropolitan Region of Santiago | | 5.2 | 15.8 |

Source: National Statistics Institute, 1987 Demography Yearbook. Santiago, 1989.

In 1987, the neonatal death rate was 9.6 deaths of children under 28 days per 1,000 live births, or approximately 50% of total deaths of children under 1 year old. An important factor in the reduction of neonatal mortality has been the lower proportion of live births with low birthweight, which varied by socioeconomic level of the mother from 7.1% to 4.6% (1984 figures). The national average for 1985 was 6.4%.

Mortality in children aged 1 to 4 years showed a similar trend to that for infant mortality: in 1960, the recorded rate was 9.1 deaths per 1,000 children of that age group, in 1970 it was 3.80, and in 1987 it dropped to 0.8.

In 1987, the National Supplementary Food Program (PNAC) served 1,237,000 children under 6 years old. A reduction of malnutrition (according to the Sempé weight for age indicator) has been noted in children under 6 years old covered by the PNAC: in 1978, 14.9% of children suffered from malnutrition (11.9% mild, 2.5% moderate, and 0.5% serious); in 1987, 8.8% suffered malnutrition (7.9% mild, 0.8% moderate, and 0.1% serious).

At Santiago's Institute for Child Rehabilitation, the leading cause of childhood disability is cerebral palsy, which accounts for 51.8% of all child disabilities. A trend toward the presentation of milder forms has been observed, which is attributed to improved care for pregnant women and newborns. Five percent of schoolchildren have oral health problems; 15.6% to 21.7%, ocular disorders; and 10% to 15%, posture disorders.

Health of Adolescents, Adults, and the Elderly

An estimated 55% of deaths in the 10–24-year-old age group are the result of accidents, suicides, and other violent acts. Early sexual activity is another risk, both for sexually transmitted diseases and for undesired pregnancies (15.2% of live births are to women under 20 years).

Maternal mortality has continued to decrease. The maternal death rate was 29.9 per 10,000 live births in 1960, 16.8 in 1970, 7.3 in 1980, and 4.8 in 1987. This reduction began 50 years ago, as a result of maternal and child health programs that emphasized prenatal care and, especially, professional care of deliveries, which came to 98.1% in 1987.

Another important factor in the decrease in fertility and the reduction in induced abortions was the broad access to birth-control methods among Chilean women since the 1960s and continuing at least up to 1979. In the 1970s the effect of these activities could be seen in reductions in the birth rate and in multiparity greater than three, as well as in the increase of intervals between pregnancies. By the 1970s, deliveries were concentrated in the lesser-risk age groups.

Abortion accounted for 35.4% of maternal deaths reg-

istered in 1980–1986, which makes it the leading cause of maternal death. In 1987, the maternal death rate due to abortion was 1.7 per 10,000 live births. Other leading causes of maternal mortality are toxemia (1.0 per 10,000 live births in 1985) and other complications of delivery and the puerperium (2.1 per 10,000 live births in 1985). The 1988–1989 Women's Health Plan currently being implemented, addresses morbidity and mortality, social support, legal rights, promotion of breast-feeding, cancer prevention, family education, and smoking prevention.

Occupational diseases are significantly underregistered. The most frequent reports, in descending order, are ocular, osteomuscular, and rheumatic diseases, and dermatoses. Occupational bronchopneumopathies fell from second place in 1975 to sixth place in 1983.

In a study of the needs of the older adult population in urban districts, 71.9% of the interviewees stated that they suffered from some disease at the moment of the survey. Of these, 17.7% had diseases of the circulatory system and 14.9% had diseases of the musculoskeletal system. Hospital stays of the elderly are increasing in length, with average stays of 20 or more days for the population 60 years old and over.

The country's morbidity information is provided by the compulsory notification system, which gathers the weekly and monthly statements of notifiable cases diagnosed in the public health services. In addition, since 1960 the universities and other nongovernmental agencies have conducted 21 morbidity surveys. Six of these, whose coverage was limited, refer to general morbidity. In the last, carried out in 1985 in 12 cities, total morbidity detected was 5.93%; 1.46% of respondents reported episodes of acute disease, 0.17% reported accidents and violent acts, and 4.30% declared they suffered from chronic diseases.

The country has experienced an overall downward trend in the incidence and prevalence of communicable diseases. In 1985, the death rate due to tuberculosis was 6.2 per 100,000 population and morbidity, 70 per 100,000 population. For typhoid fever, the registered rate in 1985 was 63.6 cases per 100,000 inhabitants; in 1987, 5,555 cases were registered; and in 1988, 5,086. The number of deaths due to diphtheria is fewer than 20, and there are fewer than 300 cases per year. In 1987, there were 169 cases and in 1988, 120. In 1986, 38 cases and two deaths due to whooping cough were reported; in 1987, 42 cases were reported; and in 1988, 194. Epidemic cycles of measles occur every four years; the last epidemic was in 1988, with 43,771 cases reported. Since 1976, no cases of poliomyelitis have been registered. Some publications point to a possible increase in some diseases of the skin, such as pediculosis, scabies, and impetigo.

Syphilis has steadily decreased: in 1988, 3,804 cases

were registered, 50% less than in 1980. The rate ranges from 6 to 7 per 100,000 population. Gonorrhoea has held steady, with an approximate rate of 100 cases per 100,000 population (10,693 reports in 1988). As of 30 September 1989, 164 AIDS cases were reported, of which 68 died. The most affected age group is from 30 to 44 years old, accounting for approximately 50% of the total. The distribution of 36 cases by risk factors shows that 32 were homosexuals, 2 had received blood transfusions, and 2 were intravenous drug users.

The overall cancer death rate has remained unchanged since the 1960s. Malignant neoplasms of the stomach and the esophagus account for 25% of all malignant neoplasms and show a tendency to relative decreases, while the proportion of deaths from malignant neoplasms of the lung, liver, and bile ducts has increased. The most frequent sites of malignant neoplasms resulting in deaths in the population over 15 years old in 1984 were the stomach (19.7%), the lungs (10.2%), the gall bladder (8.1%), the cervix (5.8%), the breast (5.6%), and the colon and rectum (5.2%). Leukemias account for 65.2% of cancer mortality in persons under 15 years of age.

In 1985, the death rate due to breast cancer was 16.8 per 100,000, and from cancer of the cervix, 17.9 per 100,000. Most of these cancers are diagnosed in advanced stages. In the cases studied, most are associated with early reproductive activity, early sexual relations, promiscuity, and a low socioeconomic status.

Cardiovascular diseases are the leading cause of death, with an approximate rate of 168 per 100,000 population. The greatest mortality is caused by ischemic heart diseases, of which myocardial infarction accounts for 24% of all deaths due to cardiovascular diseases and 6.5% of total mortality. The highest rates occur in the regions of Valparaíso and Santiago. Educational campaigns are being undertaken to change risk factors.

In 1987, accidents and violent acts (E800-E999) accounted for 12% of total deaths. During 1979–1987, this category's contribution to mortality has been between 12% and 13%. Of the deaths in this classification, 38% are due to accidents of all types, and almost one-fourth of these involve motor vehicles.

The prevalence of diabetes is approximately 12 per 1,000 (92 per 1,000 for the population over 60 years old). It is noteworthy that diabetes is significantly increasing as a cause of hospital discharges.

The country's main mental health problems are related to alcohol dependency, neurotic disorders due to unemployment, drug abuse, and senile and presenile psychoses. The prevalence of alcoholism is 5% for the population over 15 years old; approximately 15% of all adults consume alcohol in excess.

The prevalence of smoking diminished from 47% to 44% in men while increasing from 36% to 41% in

women. In 12 Chilean cities studied, this addiction was related to family income (greater prevalence at greater incomes) and to years of schooling.

The prevalence of caries in the population is 91%. At 40 years of age the average number of teeth lost is 12.8 per person.

The most important zoonoses are hydatidosis and distomatosis, although the rates for both have decreased in recent years. Trichinosis, cysticercosis, and bovine tuberculosis do not show a significant prevalence. In Chile no case of human rabies has been registered since 1972. There are 478,000 dogs in the Metropolitan Region; the rate of bitten persons is 276.0 per 100,000 population.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

Since the first half of this century, health services in Chile have come under several public and private institutions; in 1924, the Ministry of Hygiene, Assistance, Social Welfare, and Labor was created. The Chilean Medical Association was established by law in 1948 and has always been very influential in the formulation of health policies. The University of Chile created the School of Health in 1943. In 1952, a law was passed establishing compulsory insurance against the risks of disease, disability, old age, and death, and the National Health Service was established. It brought together the various agencies that provided health services. The National Health Service's basic doctrine includes normative centralization; unification of the administrative, information, supply, and supervision systems; and operational decentralization.

The health policy's frame of reference and doctrinal framework are oriented by overall government policy. In general, the health care system operates according to three options: the State system, called the General Health Regimen, made up of the 27 services; the free-choice regimen; and the private alternative for medical care represented by the Health Promotion Institutions (ISAPRES). Together, these cover approximately 1,450,000 persons with some form of private family insurance, and provide services through the private network of establishments. The National Health Fund (FONASA) regulates the financing of the three alternatives. The Armed Forces have their own health services.

The country fully pursues the strategy of deconcentration and decentralization. This process began in 1973 with the creation of the National Commission for Ad-

ministrative Reform; in 1974, decrees 573 and 575 established "a system that permits administrative and regional decentralized development." These decrees set levels of authority and establish regional, provincial, and municipal levels. The last one has gathered major importance in the administration of community services, including health services. In the health sector, these directives were solidified in 1980 with the creation of the National System of Health Services, which includes 13 regions subdivided into 27 health services. Transfer of the health units (health posts and clinics) to the municipalities began in 1981 and was completed in March 1987. Mayors are designated by the President of the Republic, a practice that limits the democratizing role of the municipalities in the administration of community services.

The country's health policies can be summarized as follows: a) objectives and programs aimed at meeting the priority needs of the more vulnerable population groups, such as mothers, children, and the malnourished; b) permanent activities to control communicable diseases; c) adoption and development of the primary care strategy for carrying out activities included under the previous points; d) deconcentration and decentralization as a strategy for involving the community in the process of social development, including the assessment and strengthening of local health systems; e) formulation and affirmation of the "principle of State subsidies;" f) creation of special funds for financing actions for health (FONASA) and development (Regional Development Fund); and g) promotion of administrative efficiency.

Production of Services

A study on disease care in 12 cities shows that 63.9% of cases were served by the National System of Health Services (SNSS) and 6.2% by other public sector institutions; 18.2% were financed by the National Health Fund, 3.3% by Health Promotion Institutions, and 8.4% were paid for by private payments.

In 1985, the SNSS and other services gave 37,902,000 consultations, equivalent to a rate of 3.1 consultations per inhabitant per year and representing an increase of 41% in relation to 1980.

The number of emergency consultations is striking. Depending on the year, they accounted for 25% to 29% of all consultations. From 1965 to 1984, total medical consultations increased 25.5%, while emergency consultations rose 221.6%.

In the SNSS establishments, children receive an average of 1.73 consultations per year and adults, 0.94. In 1985, children's consultations accounted for 47% of the total.

From 1972 to 1982, care given by nurses, midwives,

and nutritionists increased significantly, from almost three million to more than ten million. In the same period care given by auxiliaries fell 32%.

There are more than one million hospital discharges per year, with a proportion of 10.5 discharges per 100 population (1986). Currently, the average length of stay is 8.5 days, and there are 37.5 discharges per bed per year. In 1986, 90.4% of the total days of hospitalization and 52.9% of surgical interventions corresponded to the SNSS.

Installed Capacity

The health care network includes 180 hospitals organized in four levels of complexity. The first level, the most sophisticated, encompasses 20 institutions, including teaching hospitals. The second level has 30 hospitals; the third level, 25; and the least complex level, 105. Out-patient care is conducted through three basic types of units: primary care facilities, polyclinics, and emergency services. The primary care facilities include 210 urban general clinics, 107 rural general clinics, 994 rural health posts, and 190 polyclinics. It is estimated that this network, plus the hospitals, provides coverage to the entire population.

The private sector has 24 hospitals and 150 clinics, in addition to 385 medical centers and 389 clinical laboratories. In 1987, the country had 41,827 beds, or 3.4 beds per 1,000 population; 78% belonged to the SNSS.

Financing of the Health Services

Public spending in health, considered as a percentage of total public spending since 1974, shows a minimum of 8.0% in 1974 and a maximum of 9.8% in 1979 and 1982. As a share of the GDP, public spending ranges from a minimum of 2.4% in 1976 and 1980 to a maximum of 3.4% in 1982. In 1986, the figures were 8.6% of total public spending and 2.6% of the GDP. The variations in these figures, which depend on the deflator used by different researchers, have caused some controversy.

Public spending in the health sector increased from Ch\$71.81 billion in 1985 to Ch\$85.22 billion in 1987 (in 1985 pesos). Per capita expenditure rose from Ch\$5,899 to Ch\$6,798 in that same period.

The Government underwrites approximately 60% of the total costs of the National System of Health Services and of the National Supplementary Food Program; the remainder is covered by workers' contributions. FONASA finances the SNSS in two ways: paying for personnel expenditures and defraying the costs of goods and services in accordance with a plan for partial refund-

ing of amounts billed for care provided. This method was subsequently expanded to the municipalities.

Human Resources

Eight universities conduct training in the health sciences through study programs in medicine, dentistry, biochemistry and pharmacy, nursing, obstetrics, nursing and obstetrics, nutrition, medical technology, kinesiotherapy, occupational therapy, speech therapy, and psychology. Approximately 4,500 students attend the schools of medicine. The study program lasts seven years. From 1975 to 1984, 5,678 physicians graduated; currently, approximately 600 students graduate each year.

In 1988, there were 8.0 physicians, 2.6 dentists, 2.0 nurses, and 20.6 auxiliaries per 10,000 population. It is estimated that in 1983 there were 10,867 physicians, including those working in the public sector (SNSS), those in private practice, and those who had retired. Of the total number of physicians, 62.2% work in the SNSS, 16.3% in universities, and 5.6% in private practice. From 1972 to 1984, the number of physicians' posts in the SNSS increased from 4,366 to 6,067, which represents an increase of 39%; the ratio of physicians per inhabitant increased 13.6%.

Some 250 dentists graduate annually. The total number of students enrolled in the five-year study program is approximately 1,400. In 1983, there were 5,100 dentists. From 1972 to 1984 the number of dentists in the SNSS increased 33%, and the ratio per 10,000 population increased 8.7%. The country has a relative insufficiency of dentists.

From 1975 to 1984, 4,318 university nurses graduated after completing five years of studies. Enrollment in nursing programs has declined from 3,334 in 1975 to 1,261 in 1984, generating concern regarding the availability of

nurses. The country has approximately 25,000 well-trained nursing auxiliaries.

The training of technicians follows the technological development of medical care as the new technology becomes ever more complex.

In Chile 81.5% of researchers work in the universities. Of these, 15.7% are devoted to research in the health sciences. Financing for research accounts for 0.4% of the GDP. Scientific development and research are supported by the National Scientific and Technical Research Council and by the Fund for Scientific and Technological Development. The Institute for Nutrition and Food Technology performs basic research and development of personnel in nutrition, and plays a significant role in research, personnel training, and publication in its field. This institute conducts a master's course in food and nutrition at the international level.

HEALTH AND THE ENVIRONMENT

In December 1986, the water supply companies covered 82.3% of the total population and 97.0% of the urban population. The urban population whose water supply is of poor bacteriological quality ranges from 5.4% to 7.5%, depending on the year in question, and that with poor physical and chemical quality, from 8.5% to 12.1%.

In 1986, 62.9% of the total population and 77.1% of the urban population had sewerage services. The services are provided by three large companies and other smaller companies, which are both municipal and private. In 1970, 66.5% of the urban population had drinking water services and 31.1% had sewerage services.

Air pollution in the metropolitan area of Santiago is a source of great concern, given the upward trend in suspended particulates, carbon monoxide, nitrogen oxides, and acidity of the air.

COLOMBIA

GENERAL CONTEXT

Political, Economic, and Social Situation

The Government of Colombia is constituted by the legislative, executive, and judicial branches. The legislative branch, under the responsibility of the Senate and the Chamber of Representatives, drafts legislation, oversees the executive branch, and provides political representation. The executive branch rests with the President, the Cabinet Ministers, and the chiefs of administrative departments and authorities at the national central level. The President and members of Congress are elected by direct vote. The judicial branch is constituted by the Supreme Court of Justice, the Council of State, the Superior Tribunals, the Administrative Tribunals, and the Courts.

The country is divided into 23 departments, four intendancies, five commissariats, and two Special Districts (Bogotá and the Tourist and Cultural District of Cartagena). Bogotá is the national capital and the seat of the national government.

Administration of the country's subdivisions is done independently by the departments, intendancies, commissariats, and the Special District of Bogotá, taking into account the restrictions established by the Constitution. Each department is administered by an assembly and a governor, whose respective functions are similar to those of the Congress and the President, at the national level. At the municipal level, the councils, also called *cabildos*, municipal councils, or municipalities, function as the assemblies in that their purpose is to promote a decentralized administration. They are presided over by a mayor. Since 1988, council members and mayors have been elected by popular vote.

In 1986, the gross domestic product (GDP) came to 6,701.42 billion current pesos; the population was 28.2 million. In the last 50 years, total GDP increased ninefold, registering an average annual growth of 5%. In 1986, more than 50% of the GDP was generated in the tertiary sector, sparked by the growth of activities related to transportation, communications, modern public services, government, and the financial sector. The secondary sector, which includes industry and construction, accounts for nearly 30% of the GDP. The primary sector, principally agriculture, accounts for just over 20% of the

GDP. GDP expenditures were 75% for final consumption, 17% for gross domestic capital formation, and 8% for the external commercial balance (19% for total exports and 11% for total imports).

In 1986, per capita income came to \$US1,905; inflation, which was relatively low compared with previous years, was 21% (it increased to 28% in 1988). Public spending, which amounted to \$Col 940.23 billion, or 14% of GDP, increased 37.8% in 1986.

This economic change has occurred simultaneously with a population shift from rural to urban areas. This has modified the employment structure, particularly regarding the service sector, and has revealed open unemployment, a shortage of housing and public services, and insufficient food for a vast segment of urban dwellers.

In addition to domestic changes, an external dependency also has prevented economic and social development. This development has been primarily determined by fluctuations in coffee prices, which have continuously shaped the country's destiny and economic situation. The search for stability and efforts to moderate coffee cycles and the shocks of the international economy have determined the State's short- and long-term orientation of the economic process. However, it has not been possible to diminish the impact of the external cycles, to reduce dependency, and to prevent externally imposed limitations from controlling internal pressures.

Demographic Characteristics

According to the 1985 census, the population was 27.9 million, of which 12.2% (3.4 million) were children under 5 years old; 24.0% (6.7 million), children aged 5 to 14 years old; 52.0% (14.5 million), from 15 to 49 years old; 5.7% (1.6 million), from 50 to 59 years old; and 6.1% (1.7 million), 60 years and older. The increase in the older population and the reduction in the young population is a general trend that has been under way since the 1970s. This process has resulted from the reduction of the birth rate (from 33 per 1,000 population in 1973 to 25 per 1,000 in 1985), the reduction of overall mortality (from 6.3 per 1,000 population in 1981 to 5.6 per 1,000 in 1984), and the resulting increase in life expectancy at birth. There are major differences among

regions: life expectancy at birth in Cali is 69.6 years, and in Cauca and Nariño it is 54.0 years.

The annual rate of population increase has been reduced to 1.75%; given the accelerated decline of the birth rate, which is estimated to be 20 per 1,000 population by 1990, and the anticipated stabilization and later decline in overall mortality, a greater reduction is expected for the medium term.

Urbanization has been a major demographic phenomenon in the second half of the 20th century: the percentage of urban residents increased from 30% in 1938 to 67% in 1985. Most migration has been to the intermediate and large cities, where much of this population has no easy access to basic services.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

The significant underregistration of deaths is due to factors such as the population's lack of motivation because it does not view registration as useful; deficiencies in the data collection process (loss of information or omissions); and interment outside the cemeteries, especially of children and in rural areas. According to a 1986 assessment of omissions in the registration of deaths, it was estimated that only 85% of deaths are registered.

From 1981 to 1986, overall mortality decreased from 6.3 to 5.6 per 1,000 population. In 1986, infant mortality was 41.1 per 1,000 live births, maternal mortality was 1.0 per 1,000 live births, and mortality of persons 60 years and older stood at 39.5 per 1,000 population. There are marked differences in infant mortality rates among the different regions. For example, in the Pacific Region mortality is double that of Bogotá.

With some exceptions, the structure of mortality by causes remained much the same for 1981–1986. The most significant change was the increase in deaths due to homicide and injury purposely inflicted by other persons, which in 1981 was the second leading cause of overall mortality, accounting for 6.4% of deaths due to defined causes, and which in 1986 became the leading cause, with 10.2% (Table 1).

In 1986, 49.3% of deaths in children under 1 year old (excluding those attributed to symptoms and ill-defined conditions) were due to three groups of causes: 20.2% to hypoxia, birth asphyxia, and other respiratory conditions originating in the perinatal period (768–770); 15.6% to other causes of perinatal mortality (760, 761, 764–766, 771, 772, 774–779); and 13.5% to enteritis and other diarrheal diseases (008, 009). A total of 25,244

deaths of children under 1 year old were registered. Of these, 903 (3.6%) were attributed to signs, symptoms, and ill-defined conditions. Other major causes were pneumonias (481–483, 485, 486), which accounted for 11.3% of the deaths; protein-calorie and unspecified protein-calorie malnutrition (262, 263), for 3.9%; and congenital anomalies of the heart (745, 746), for 3.8%.

In 1986, enteritis and other diarrheal diseases and pneumonias were the first and second leading causes of death in the 1–4-year-old age group, accounting for 16.6% and 12.1%, respectively, of all deaths from defined causes in that age group. Accidents caused by submersion, suffocation, and foreign bodies (E910–E915) ranked third, with 6.9% of all deaths from defined causes; protein-calorie malnutrition and other unspecified protein-calorie malnutrition (262, 263) were the fourth leading cause, with 6.5%. A total of 8,980 deaths were registered in the 1–4-year-old age group; of these, 7.7% were attributed to signs, symptoms, and ill-defined conditions.

In 1986, the three leading causes of death in the age group 5 to 14 years were motor vehicle traffic accidents (E810–E819); accidents caused by submersion, suffocation, and foreign bodies (E910–E915); and other accidents (E916–E921, E924–E928), accounting for 12.4%, 7.9%, and 5.8% of deaths from defined causes, respectively. They were followed in order of importance by leukemia (204–208), with 5.3%; pneumonias, with 4.7%; and homicide and injury purposely inflicted by other persons, with 4.2%. A total of 3,795 deaths were registered in this age group, 6.3% of them attributed to ill-defined causes.

The causes of death directly associated with violence—homicides, motor vehicle traffic accidents, “other” accidents, and injuries whether accidentally or purposely inflicted—were the four leading causes of death in 1986 in the 15–44-year-old age group, accounting for 53.0% of the 31,666 deaths due to defined causes. In addition, 895 deaths due to ill-defined causes were also registered.

In the age group 45 to 59 years old, diseases related to the circulatory system, such as acute myocardial infarction and cerebrovascular disease, were the two leading causes of death in 1986, accounting for 12.6% and 9.2% of deaths from defined causes, respectively. Homicides ranked third, with 8.1%. A total of 18,958 deaths due to defined causes and 738 due to ill-defined causes (3.7% of the total) were registered in this age group.

In the age group 60 years and over the leading causes of death in 1986 were those associated with the circulatory system, which accounted for 45.8% of deaths due to defined causes: 13.6% due to acute myocardial infarction, 12.7% due to diseases of pulmonary circulation and other diseases of the heart, 12.0% due to cerebrovascular disease, 4.7% due to hypertensive disease, and 2.8% due to ischemic heart disease. A total of 63,059

| Groups of causes (ICD-9) | Rank | Deaths | % ^b |
|--|------|---------|----------------|
| All causes ^a | — | 158,731 | 100.0 |
| Symptoms, signs, and ill-defined conditions (780–796, 798, 799) | — | 6,667 | 4.2 |
| All defined causes ^b | — | 152,064 | 100.0 |
| Homicide and injury purposely inflicted by other persons (E960–E969) | 1 | 15,556 | 10.2 |
| Acute myocardial infarction (410) | 2 | 12,857 | 8.5 |
| Diseases of pulmonary circulation and other forms of heart disease (415–429) | 3 | 11,746 | 7.7 |
| Cerebrovascular disease (430–438) | 4 | 11,270 | 7.4 |
| Pneumonias (481–483, 485, 486) | 5 | 5,397 | 3.5 |
| Motor vehicle traffic accidents (E810–E819) | 6 | 4,444 | 2.9 |
| Hypertensive disease (401–405) | 7 | 4,127 | 2.7 |
| Enteritis and other diarrheal diseases (008, 009) | 8 | 3,968 | 2.6 |
| Malignant neoplasm of stomach (151) | 9 | 3,810 | 2.5 |
| Diabetes mellitus (250) | 10 | 2,857 | 1.9 |

^aIncludes deaths of persons whose age is not known.

^bThe percentages by cause are based on total deaths from defined causes.

Source: National Administrative Department of Statistics (DANE), Register of deaths.

deaths from defined causes and 3,085 attributed to symptoms and ill-defined conditions were registered.

Mortality due to diseases that are under epidemiological surveillance diminished. Their share of overall mortality fell in 1985–1988 from 9.2% to 4.0% (from 57.9 to 20.2 per 100,000 population). Measles dropped from third place to seventh place among the causes of death under surveillance; acute poliomyelitis dropped from seventh to ninth place; and neonatal tetanus climbed from fourth to third. Diarrhea and enteritis remained as the leading cause, arterial hypertension continued to rank second, and respiratory infections moved from sixth to fifth place.

For the population as a whole, morbidity attended to in hospitals maintained the same basic structure from 1981 to 1986 (Table 2). Excluding hospital discharges for normal delivery, abortion was the leading cause of hospitalization in 1981 and 1986, followed (in 1986) by complications occurring mainly in the course of labor and delivery and complications mainly related to pregnancy. Enteritis and other diarrheal diseases decreased; they ranked third in 1981 and sixth in 1986.

In children under 1 year old the leading cause of hospitalization was enteritis and other diarrheal diseases, which showed a marked decrease (in 1981, this cause was

responsible for 33.6% of discharges from defined causes, while in 1986 this figure had fallen to 21.2%). In children, the percentage of discharges for hypoxia, birth asphyxia, and other respiratory conditions originating in the perinatal period increased from 5.0% of discharges due to defined causes in 1981 to 8.7% in 1986.

Pneumonias were the leading cause of morbidity in hospitals among children 1 to 4 years old, representing 16.8% of the discharges due to defined causes; enteritis and other diarrheal diseases occupied second place, with 15.7%; and bronchitis, emphysema, and asthma were third, with 10.2%.

In the age group 5–14 years old, fractures of limbs was the leading cause of hospitalization in 1986, followed by appendicitis (6.1%) and by bronchitis, emphysema, and asthma (5.5%).

The causes related to pregnancy and delivery, such as abortion; complications occurring mainly in the course of labor and delivery; and complications mainly related to pregnancy accounted for the largest number of hospital discharges in the age group 15–44 years old. Approximately one-half of deliveries are attended to in institutions at all levels of complexity, without distinguishing among types of risk. The leading cause of hospital discharges, including those from high technology institutions, is nor-

| Groups of causes (ICD-9) | 1981 | | | 1986 | | |
|---|------|------------|----------------|------|------------|----------------|
| | Rank | Discharges | % ^a | Rank | Discharges | % ^a |
| All causes | — | 1,554,026 | 100.0 | — | 1,709,272 | 100.0 |
| Symptoms, signs, and ill-defined conditions (780–796, 798, 799) | — | 34,189 | 2.2 | — | 37,603 | 2.2 |
| All defined causes ^a | — | 1,519,837 | 100.0 | — | 1,671,669 | 100.0 |
| Normal delivery (650) | 1 | 360,534 | 23.7 | 1 | 396,551 | 23.7 |
| Pregnancy with abortive outcome (630–639) | 2 | 73,039 | 4.8 | 2 | 71,789 | 4.3 |
| Enteritis and other diarrheal diseases (008, 009) | 3 | 69,931 | 4.6 | 6 | 47,860 | 2.9 |
| Complications occurring mainly in the course of labor and delivery (660–669) | 4 | 62,161 | 4.1 | 3 | 68,371 | 4.1 |
| Pneumonias (481–483, 485, 486) | 5 | 45,067 | 3.0 | 8 | 47,860 | 2.9 |
| Complications mainly related to pregnancy (640–646) | 6 | 43,513 | 2.9 | 4 | 58,115 | 3.5 |
| Other diseases of the genital organs (601–608, 614.3–614.9, 615–617, 619–629) | 7 | 40,405 | 2.7 | 7 | 47,860 | 2.9 |
| Hernia of the abdominal cavity (550–553) | 8 | 34,189 | 2.2 | 9 | 35,895 | 2.1 |
| Fractures of limbs (810–829) | — | — | — | 10 | 32,476 | 1.9 |
| Other indications for care in pregnancy, labor, and delivery (652–659) | 9 | 27,972 | 1.8 | 5 | 54,697 | 3.3 |
| Bronchitis, emphysema, and asthma (490–493) | 10 | 27,972 | 1.8 | — | — | — |
| Other | — | 735,054 | 48.4 | — | 810,195 | 48.5 |

^aThe percentages by cause are based on total discharges for defined causes.
Source: Ministry of Health. Health Information Subsystem (SIS-110).

mal delivery (23.7%), even though there is a risk-based maternal care model.

In the population group 60 years and older, other forms of heart disease, cerebrovascular disease, and hernia of the abdominal cavity were the three leading causes of hospital discharges in 1986, accounting for 9.8%, 5.5%, and 4.5%, respectively, of discharges from well-defined causes in that age group.

Morbidity registered in outpatient services had a similar structure in 1981 and 1986 for the ten leading causes. The most important change in the period was the decline in importance of enteritis and other diarrheal diseases, and the increased importance of other diseases of the genital organs, acute respiratory infections, and diseases of skin and subcutaneous tissue (Table 3).

Problems Affecting the General Population

Sexually transmitted diseases showed a rising trend, especially syphilis, which increased from 58 to 66 cases per 100,000 population from 1980 to 1987. Gonococcal infections increased from 145 to 167 per 100,000 population in the same period. A total of 247 cases of AIDS were registered from 1985 to 1988.

Accidents cause one of every ten deaths in the country, and particularly affect children under 5 years old. For the emergency response to accidents, there is a hospital infrastructure in place; however, there are very few resources for rehabilitation, and only an incipient infrastructure for prehospital response. The outlook is even bleaker regarding the organization, standardization, lo-

| TABLE 3 | | | | | | |
|---|------|---------------|----------------|------|---------------|----------------|
| Leading causes of outpatient consultations (official and mixed subsectors), Colombia, 1981 and 1986. | | | | | | |
| Groups of causes (ICD-9) | 1981 | | | 1986 | | |
| | Rank | Consultations | % ^a | Rank | Consultations | % ^a |
| All causes | — | 11,408,169 | 100.0 | — | 15,117,550 | 100.0 |
| Symptoms, signs, and ill-defined conditions (780–796, 798, 799) | — | 479,144 | 4.2 | — | 559,351 | 3.7 |
| All defined causes ^a | — | 10,929,025 | 100.0 | — | 14,558,199 | 100.0 |
| Other helminthiasis (120–124, 127–129) | 1 | 581,816 | 5.3 | 6 | 423,291 | 2.9 |
| Enteritis and other diarrheal diseases (008, 009) | 2 | 570,408 | 5.2 | 4 | 498,879 | 3.4 |
| Other diseases of the genital organs (601–608, 614.3–614.9, 615–617, 619–629) | 3 | 559,000 | 5.1 | 3 | 665,172 | 4.6 |
| Diseases of skin and subcutaneous tissue (680–686, 690–698, 700–709) | 4 | 547,592 | 5.0 | 1 | 710,525 | 4.9 |
| Acute respiratory infections (460–466) | 5 | 524,776 | 4.8 | 2 | 710,524 | 4.9 |
| Influenza (487) | 6 | 501,959 | 4.6 | 10 | 336,973 | 2.3 |
| Other diseases of urinary system (591, 593, 595–599) | 7 | 365,061 | 3.3 | 7 | 393,056 | 2.7 |
| Lacerations, injuries, and traumatism of the blood vessels (870–887, 890–897, 900–904) | 8 | 365,061 | 3.3 | 5 | 423,291 | 2.9 |
| Bronchitis, emphysema, and asthma (490–493) | 9 | 342,245 | 3.1 | — | — | — |
| Hypertensive disease (401–405) | 10 | 319,429 | 2.9 | 8 | 347,704 | 2.4 |
| All other infectious and parasitic diseases (086, 088, 100–104, 118, 125, 130, 131.8, 131.9, 132–136) | — | — | — | 8 | 347,704 | 2.4 |
| Other | — | 6,251,677 | 57.2 | — | 9,701,080 | 66.6 |

^aThe percentages by cause are based on total discharges for defined causes.
Source: Ministry of Health. Health Information Subsystem (SIS-103).

gistics, and care in the case of major emergencies such as disasters. The difficulties that the country has experienced in confronting such emergencies in recent years reveal this situation.

Jungle yellow fever caused an annual average of six deaths from 1985 to 1988. Vaccine coverage has been low due to lack of resources and obstacles in the vaccine's administration.

Malaria specifically affects the populations living in the country's rural tropics. Some 19.2 million inhabitants are exposed to the disease, given that the vector (*Anopheles*)

is found in 85% of the national territory. In 1988, 86,849 cases were registered (33% due to *Plasmodium falciparum*). Multiple factors are responsible for the disease's endemicity, including the parasite's resistance to drugs used for specific treatment; the presence of *P. vivax* in much of the country (in a ratio of 3 to 1 as compared to *P. falciparum*); foci of resistance of the vector to DDT in the regions of Urabá and Catatumbo; low coverage of spraying; and poor housing conditions.

In the last five years, dengue, in the virus' four serotypes, has affected the populations living in the Atlantic

and Pacific coast regions and in the basins of the Upper and Lower Cauca and Magdalena rivers, where 15 million people live. The situation is a matter of concern, given that there is low coverage of spraying and a high infestation of *Aedes aegypti* in the principal urban centers of these regions.

The National Health Study (1977–1980) found that 96.7% of the population has a history of dental caries, of which 13% appeared to have diseases due to dental problems. The availability of dental treatment services is very low. Programs are directed to schoolchildren and pregnant women, and services are provided based on demand; however, coverage reaches only 8% of the school-age population. Poor dietary and hygienic habits and the lack of fluoride are perhaps the most important factors responsible for dental pathology. Water fluoridation has been irregular and is only done in 22 water supply systems. Currently, a program to fluoridate salt for human consumption is being implemented to address this problem.

The above-mentioned National Health Study revealed that 1.5% of the population had been involved in some accident; 40% of these accidents were occupational and led to disabilities at the rate of 1.5 days per person annually.

A significant portion of the adult population is overweight and/or obese (estimated at 12% in men and 30% in women), with no major differences seen between urban and rural areas.

The incidence of tuberculosis remains high, affecting nearly 50 persons per 100,000 population; the Indian groups are the most affected. The incidence of leprosy was 3.2 per 100,000 population in 1978, 3.4 in 1981, and 2.9 in 1987.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

The health care sector's services are divided into three subsectors which are functionally organized within the National Health System: the official subsector, social security, and the private subsector. The System has been defined as a set of agencies, institutions, and entities whose specific purpose is to ensure the promotion, protection, recovery, and rehabilitation of the community's health. The Ministry of Health is charged with the System's direction. The System is organized into three basic levels: national, sectional, and local. The national level is

constituted by the Ministry of Health, public facilities, and health insurance authorities. The sectional level is made up of the Sectional Health Service and the entities that come under it or are linked to it. This level, in turn, is divided into regional health units. Each unit serves a given geographical area, and each has a second-level-of-care hospital that gives direction to the System and provides reference services for the area it covers. The local level comprises those units that implement health programs, such as local hospitals, health centers, and health posts.

The System encompasses the following aspects: regionalization, the different levels of care or services delivery, administrative development, interdisciplinary work, intrasectoral and intersectoral relations, and community participation. Its components are: a legal structure, organization, standardization and the subsystems (planning, research, personnel, investment, supplies, and information). In order to incorporate different types of entities into the System, a system of integration and linkage was established with those entities that provide health services. Public entities that provide health services to the community, whether or not they receive State subsidies, are "integrated"; for-profit or nonprofit private entities, whether or not they receive State subsidies, are "linked."

The National Health System began to function in 1975. It has already integrated and coordinated those health entities totally or partially financed by the Government and has established the foundation for doing the same with the social security and private health care subsectors.

Only 16% of the country's population is affiliated with or a beneficiary of some social security system, which includes the Social Security Institute, the Insurance Funds, and the Family Compensation Funds. Private medical insurance covers 1.5% of the population. Currently, efforts are being made to expand this coverage through voluntary medical insurance and the system of family medicine. Social security coverage varies considerably by age, degree of urbanization, region, family income, and other socioeconomic variables. Social security systems reach only 9.7% of children 1 to 4 years old, 6.1% of the localities with fewer than 2,500 inhabitants, 3.3% of the rural population, and 0.8% of persons whose family income is less than or equal to the minimum wage.

Given the low coverage of social security, the private system, and other entities, approximately 70% of the population remains under the direct responsibility of the official subsector.

There is no available information on the real coverage of health services; the only known information is the coverage by activities offered by the immediate official subsector—immunization coverage has reached nearly 80%, but activities of health promotion, prevention, and

recovery only cover less than 35% of the total population (Table 4).

Despite the significant development of the national health services infrastructure, whereby 86% of the rural population is no more than two hours from the nearest health center or health post and 71% is no more than two hours from the nearest hospital, real coverage and the economic and cultural accessibility to health services are considerably less. According to the National Health Study, 36% of the population felt a need for consultations, but only 12% actually went for consultations.

The disparity between the health institutions' hours and the population's schedule causes people not to utilize the services or to resort to emergency services. There are no permanent outpatient care services for users.

Installed Capacity and Production of Services

In 1986, the health sector had 3,705 outpatient care institutions (health posts and health centers) and 910 hospital facilities, with 42,253 beds. Of these beds, 71.5% belonged to the immediate official subsector, with an average occupancy of 57%, 35 discharges per bed annually, and an average stay of 5.4 days. In the social security subsector, there were 63 hospital facilities with 4,366 beds and 60% occupancy; the private subsector had 195 facilities with 8,580 beds, 59% occupancy, and an average stay of 6.1 days.

University hospitals have almost 75% occupancy, whereas local hospitals barely reach 40%. This reflects

| Activity | Population group | 1980 | 1985 | 1987 | |
|----------------------|------------------------|------------------|-------|-------------------|------|
| Medical consultation | Under 1 year old | 95.2 | 100.0 | | |
| | 1-4 years old | 50.1 | 52.2 | 69.5 ^a | |
| | 5-14 years old | 16.8 | 20.2 | 21.3 | |
| | Obstetrics | 67.7 | 76.5 | 76.0 | |
| | Others 15-44 years old | 28.7 | 31.5 | 30.0 | |
| | 45-59 years old | 25.4 | 26.8 | 27.8 | |
| | 60 years and older | 32.9 | 35.3 | 36.6 | |
| | Total | 28.0 | 31.2 | 33.3 | |
| Nursing consultation | Children under 1 year | 27.7 | 32.8 | — | |
| | 1-4 years | — | — | 17.3 ^a | |
| | 5-14 years | 1.7 | 1.1 | 0.8 | |
| | Obstetrics | 22.7 | 25.4 | 37.6 | |
| | Total | 4.6 | 3.6 | 3.7 | |
| Vaccination | | | | | |
| | Poliomyelitis | Under 1 year old | 16.1 | 60.9 | 60.9 |
| | DPT | Under 1 year old | 15.1 | 60.0 | 60.0 |
| | Measles | Under 1 year old | 13.7 | 52.0 | 52.0 |
| | BCG | Under 1 year old | 47.0 | 73.2 | 73.2 |
| Preventive dentistry | 5-14 years old | 8.5 | 19.3 | 17.4 | |
| Health promotion | Overall population | 21.2 | 32.0 | 38.3 | |

Note: Vaccination data are for the entire health sector.

^aData for children under 5 years old.

Source: Ministry of Health. Health Information Subsystem.

the scanty development of health care by levels of complexity, and leads to expensive care for resolving medium- or low-complexity problems.

Although overall installed physical capacity seems sufficient for secondary and tertiary care, there are specific regional deficiencies due to the concentration of physical resources and staff in certain areas of the country. The problem becomes critical regarding the conditions of the physical infrastructure and staff, since buildings are deteriorated; basic staff is insufficient; and, in general, the services are plagued by obsolescence, uninstalled equipment, inadequate locations, and lack of maintenance. The maintenance of the health facilities' physical infrastructure and staff is hindered by insufficient human resources development in this field and a lack of mechanisms that ensure equipment maintenance.

There is no plan for preventing the concentration of physical resources, nor are there any clear guidelines for preparing medical-architectural programs and financial feasibility studies. This leads to inequities in the network of establishments and to increasing imbalances between functional areas and intermediate and final services. The network of services has been established without considering a functional regionalization that would make possible multilevel care, with the consequent improvement in quality and reduction of costs.

Health Services Technologies

The public health laboratories have been classified according to four levels of complexity: level I encompasses basic or primary care in local hospitals, level II covers general care in regional hospitals, level III involves high technology laboratories in university hospitals, and level IV refers to the central reference laboratory at the National Institute of Health. Since 1985, the National Laboratory Network, which comes under the National Institute of Health, has been responsible for organizing and maintaining the operational infrastructure that fulfills the demand for laboratory health services. The laboratories also have resources for the control of drugs, medicines, and cosmetics.

Currently, the country has 132 blood banks, 69% of which come under the official sector.

The national production of the vaccines, reagents, and laboratory elements needed for immunization and diagnostic aid programs is low, which affects the delivery of services and makes it necessary to import these items at a very high cost.

Financing of the Health Services

Financing of the health sector has deteriorated in recent years, generating a chronic deficit. Contributions from

national, departmental, and municipal financing sources have declined to a critical level. This decline is largely due to legislative deficiencies such as legal gaps, problems of interpretation, and a lack of enforcement and control in applying regulations and to the diversion of resources to objectives other than those for which they were established.

Despite significant increases in direct contributions from the State, the health sector's share of national budgetary resources has decreased from the 10% and 11% figures for the years prior to 1978, to 4.4% in 1987. The reduction can be observed in the revenues the State grants to the country's political and administrative divisions (departments, intendancies, commissariats, and the Special District of Bogotá) for use in the health sector, which have decreased or remained unchanged. Beginning in 1987, the health sector's share of the budget started to increase slightly after legislation on taxes for liquor consumption was amended.

The State's main contribution is in the form of the *Situación Fiscal* (the portion of the national budget allocated to the health sector), and this amount has not matched what was legally stipulated. From its inception in 1973 until 1986, the total funds allocated have been 32% less than the legally stipulated amount.

In the political and administrative sections of the country, if financing sources are classified as government contributions (national, departmental, and municipal) and as earnings from the sale of services, one can observe the declining share of government contributions, which fell from 76% in 1978 to 72% in 1985. The territorial governments, through their respective budgets, contributed very little to health services financing (in 1985 they contributed only 2.5% of the respective budgets).

Regarding the utilization of resources, expenditures have increasingly outstripped revenues as a result of the reduced financing. In 1979, expenditures exceeded revenues by 3.6%, and in 1985 by 11%.

Personnel, the greatest expenditure in the sector, shows a tendency to increase despite the measures to restrict public spending applied by the last administrations; in 1979 personnel absorbed 63%, and this figure rose to 65% in 1985. The sector's general expenditures, which include hospital supplies, equipment, and building maintenance, have been decreasing in relative terms since 1982, to 4.0% in 1984 and 1985. Investments in water supply systems, sewerage systems, and environmental sanitation, despite having held steady at approximately 20% of the health budget from 1979 to 1982, declined in absolute terms and at constant prices.

Human Resources

In 1988, the health sector had 29,353 physicians, 13,815 dentists, and 7,690 nurses (Table 5). In 1987,

TABLE 5

Health manpower, Colombia, 1988.

| Level/discipline | Number |
|---|---------|
| University level | 79,225 |
| Physicians | 29,353 |
| Dentists | 13,815 |
| Nurses | 7,690 |
| Sanitary engineers ^a | 793 |
| Pharmacists | 3,090 |
| Veterinarians | 7,103 |
| Bacteriologists and clinical laboratories | 9,650 |
| Nutritionists/dietitians | 2,548 |
| Physical therapists | 2,309 |
| Occupational therapists | 581 |
| Phon audiologists | 1,237 |
| Optometrists | 1,056 |
| Technical level | 8,930 |
| Nurses | 4,250 |
| X-ray technicians | 414 |
| Health statisticians ^b | 373 |
| Technologists in health statistics | 19 |
| Sanitation promoters | 3,800 |
| Experts in occupational health | 74 |
| Auxiliary level | 54,948 |
| Nursing | 31,125 |
| Dentistry | 2,631 |
| Health promoters | 17,431 |
| Social work | 289 |
| Hospital accounting | 597 |
| Medical records | 1,608 |
| Supplies | 377 |
| Pharmacy | 890 |
| Total | 143,103 |

^aIncludes civil engineers specialized in sanitary engineering.

^bHealth statisticians replaced by the technologists.

Source: Ministry of Health. Division of Human Resources Projections and Planning.

67% of all health manpower was employed in the immediate official subsector, 7.0% in the institutional private subsector, and 26.0% in social security (16.0% in the Social Security Institute, 2.8% in the Family Compensation Funds, and 7.2% in the Social Insurance Funds).

There is no human resources development plan for the sector, and this situation is aggravated by the incongruity

among occupational profiles, the health system's needs, and the curricula for training, supplementary courses, and continuing education. As a result, human resources are underutilized and beset by instability and low productivity. Wages for similar jobs vary considerably, and there are no incentives to work in rural areas, marginal urban areas, and border areas.

HEALTH AND THE ENVIRONMENT

A total of 79% of the urban population and 17% of the rural population have water supply service. This situation remains critical, since approximately 39% of the population does not receive this service, especially those who live in marginal urban areas and in scattered rural areas, where 84% and 90% of the dwellings, respectively, are not connected to the water supply system. The water supply system coverage by levels of urbanization is: large cities (more than 800,000 inhabitants), 96.0%; intermediate cities (between 100,000 and 800,000 inhabitants), 71.9%; smaller cities (30,000 to 100,000), 62.7%; towns and small cities (12,000 to 30,000), 52.1%; and rural population centers (fewer than 12,000), 26.8%. Only 49% of the population receives safe drinking water. It is estimated that half of the water from the supply systems is lost through leaks or is wasted.

A total of 65% of the urban population and 10% of the rural has sewerage services, which means that 53% of the country's dwellings do not have sanitary excreta disposal. Of the population living in marginal urban areas, 72% does not have excreta disposal services; 90% of the concentrated rural population and 84% of the scattered rural population have the same problem. Sewerage service coverage by levels of urbanization is: large cities (more than 800,000 inhabitants), 76.3%; intermediate cities (100,000 to 800,000 inhabitants), 53.9%; smaller cities (30,000 to 100,000), 48.0%; towns and small cities (12,000 to 30,000), 35.6%; and rural population centers (fewer than 12,000), 13.4%.

Although 70% of the urban population has refuse collection services, the final disposal of this waste is inadequate: 20% goes to surface waterways, 50% to open-cut spillways, and only 30% to sanitary landfills. The National Health Study found that 83.4% of all homes store refuse inadequately; this situation is more evident in the regions with poorer health indices, in small towns, and in rural areas, where 80% of the residents dispose of refuse by dumping it outside their homes.

Air pollution is worsening. In 1986, 5.6 million tons of pollutants were produced; the most important ones are carbon monoxide, particulates, hydrocarbons, and nitrogen oxides. This pollution is generated by motor ve-

hicles and by industry, and motor vehicle pollution is on the rise. In 1980, motor vehicles were responsible for 67.7% of all air pollution, and in 1986, for 70.0%. The concentration of particulates and sulfur dioxide in the country's industrial centers (Bogotá, Cali, Medellín, Cartagena, Bucaramanga, Manizales, Nobsa, Cerromatoso, and Puracá, among others) is dangerously approaching the maximum limits established by the Ministry of Health.

The Magdalena River basin, the country's main basin and home to 80% of the population, is affected by high pollution levels from urban development (refuse and liquid wastes), industrial development, agricultural development, and mining. Other watersheds also are in critical condition. The pollution of Cartagena Bay is particularly alarming.

Deficient basic sanitation conditions, the lack of an adequate transportation system, the limited availability of electricity and equipment, the limited development of food technology, and cultural factors all make for a major risk of food contamination and deterioration.

Of the milk consumed in the country, 50% is unprocessed, and pasteurizing plants operate at only 50% of their installed physical capacity. In addition, in the course of distribution, milk is often watered down, skimmed, and subject to contamination due to poor hygiene during milking, transportation, and conservation. There are 1,300 slaughterhouses to supply the public's demand; only 11 of these are inspected and comply with Ministry of Health requirements.

About 40% of food processing plants have no sanitary license. Some 15,000 processed food products are distributed in the country, 42% of which meet sanitary and quality standards and are periodically controlled. In addition, large quantities of food enter the country as contraband with no sanitary controls.

Some 52% of scattered rural housing and 40% of concentrated rural and marginal urban housing are precariously built huts; 84% of these lack water services and 72% have no excreta disposal service. Of these dwellings, 24% have a single room and 30% are built with mud, tin, boards, or trash and have dirt floors.

COSTA RICA

GENERAL CONTEXT

Political, Economic, and Social Situation

Costa Rica's sociopolitical system features a century of democratic government, 40 years without an army, free and compulsory primary and secondary education, full political rights for women, and a statute whereby the president cannot be reelected. The political system is structured into three independent branches of government: the executive, the legislative, and the judicial. The public administration is organized into economic and social sectors made up of institutions and programs; each sector is presided over by a Minister.

The country's economy relies on the export of a few agricultural and livestock products, especially coffee, cacao, bananas, cattle, milk products, and fruit preserves. From 1962 to 1979, industrial production and exports increased within the framework of the Central American Common Market, and the gross domestic product (GDP) experienced a significant annual growth.

By the end of the 1970s, the weakness of the Central American Common Market and an accelerated external debt fueled by the ready availability of resources in the international financial markets, marked the beginning of a severe crisis that affected all economic and social sectors of the economy, leading to a 2.3% decline in GDP in 1981 and a 7.3% decline in 1982. From the middle of 1980 to the end of 1981, the colón was devaluated 320% and inflation reached 65% in 1981 and 81% in 1982. From 1982 to 1983, the unemployment rate amounted to 9.4% and the proportion of poor families increased 53%. The external debt was greater than the country's payment capacity, and the debt service absorbed more than 50% of the exports of goods and services. In 1982, the public debt was equivalent to 114.5% of the GDP. In 1983, private consumption had fallen to 79% of the 1978 level, investments had dropped to 35% of the 1977 level, and real wages were barely 74% of the 1979 level.

In order to restore economic stability, in 1983 taxes were increased, public spending was restricted, and priority was given to the promotion of exports, which required increases in the prices and in rate schedules of goods and services under State control. To avoid further deterior-

ation of living conditions for the poorest population groups and to reduce the social costs of the adjustment process, in 1982 the Program for Social Compensation was established. As a result, central government finances improved and inflation was checked; the consumer price index increased 15.4% in 1986 and 16.4% in 1987. In 1988, this figure climbed to 25.3%. Wages have increased, but still fall short of levels prior to the crisis. GDP growth was 5.5% in 1986, 5.4% in 1987, and 3.8% in 1988. Unemployment has been brought down to 5.5% since 1987.

School enrollment is 99.8% for the first two cycles, and declines beginning in the third. According to the 1984 census, the illiteracy rate is 6.9%. In 1987, 20% of the national budget went to education.

The housing shortage has worsened, and large segments of the population do not have adequate housing. The Government considers this a priority.

Demographic Characteristics

In 1987, Costa Rica had 2,790,600 inhabitants, and 2,865,800 in 1988. The average population density increased from 50 inhabitants per km² in 1984 to 56 in 1988; 45% of the population lives in urban areas and 55% in rural areas. Internal population shifts follow two major trends: from small cities and rural areas to the main urban centers; and from economically depressed rural areas or rural areas where the demand for labor has decreased and where there is greater land concentration to other rural areas undergoing development. In the last areas, much State land has been occupied and many underutilized private lands have been taken over.

Despite declines in the rate of population increase over the last 25 years, the current rate of natural increase is 2.5%. Fertility has decreased from 119 per 1,000 in 1984 to 109 per 1,000 in 1988. The percentage of those under 15 years of age diminished from 45.7% in 1970 to 36.5% in 1988, while the population aged 50 years and over increased in that same period from 10% to 12%. The age distribution was as follows: 13.5% in the 0-4-year-old age group, 23% in the 5-14-year-old age group, 59.4% in the 15-64-year-old age group, and 4.1% in those aged 65 years and over.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

Information on registrations of births and deaths indicates an estimated 1% in late registration of births and 5% in omissions and late registrations of deaths; 71% of deaths are medically certified. In the last 15 years, the number of deaths due to ill-defined causes has decreased. These quality and coverage data show that improvements in Costa Rica's health situation over the last 18 years have been greater than what had been expected on the basis of national economic conditions. These results also demonstrate what can be achieved given the political will to protect the most vulnerable human groups and the decision to focus efforts using available resources.

The overall death rate fell from 6.6 per 1,000 inhabitants in 1970 to 3.8 in 1988, and infant mortality decreased from 61.5 per 1,000 live births in 1970, to 17.4 in 1987, and 14.7 in 1988. Life expectancy at birth for 1985–1990 is estimated at 74.3 years.

Mortality and morbidity due to diseases characteristic of adults and the elderly are constantly rising. During 1970–1986, enteritis and other diarrheal diseases fell from second to thirteenth place as causes of overall mortality, decreasing their rate to less than one-tenth; during the same period, neoplasms and accidents have gained importance. Diseases of the heart have been the leading cause of death since 1970; 73% of these deaths are due to ischemic heart disease. The death rate due to myocardial infarction, which is responsible for 10% of deaths in the population over 15 years old, increased from 23.9 per 100,000 population in 1970 to 48.2 in 1986, but then declined to 28.2 in 1987. Malignant neoplasms rank second, with a rate of 79 per 100,000 in 1987. In 1986, 25% of deaths due to malignant neoplasms and 6% of all deaths in persons 15 years old and older were caused by cancer of the stomach, which is the most frequent cancer site. External causes occupy third place. Immaturity and certain conditions originating in the perinatal period rank fourth and congenital anomalies rank fifth.

Health Situation of Specific Population Groups

Child Health

The significant decrease in the mortality of children under 1 year old from 1970 to 1980 (from 61.5 to 19.1 per 1,000 live births) slowed dramatically from 1980 to

1985 (17.6 per 1,000 in 1985), especially regarding neonatal mortality, which during this period held steady at 11.2 per 1,000, and then declined to 10.1 in 1987 and to 9.3 in 1988. Perinatal mortality was 16.9 per 1,000 births in 1987.

During 1972–1974, 85% of the country's 81 cantons had infant mortality rates ranging from 20 to 70 per 1,000 live births, with a national average of 44 per 1,000; 5% of the cantons had rates of less than 20 and 10% had rates greater than 70, including one with a rate greater than 80. In 1975–1977, the national rate was 32.8 per 1,000 live births; 83% of the rates ranged from 20 to 50 per 1,000. In 1980–1982 and in 1986–1988, for which the national indicators were 19.5 and 17.3 per 1,000, respectively, about 96% of the rates varied between 10 and 24 per 1,000.

The leading causes of infant mortality have changed in the two last decades: from 1970 to 1986, enteritis and other diarrheal diseases shifted from first to fourth place, with a reduction in mortality due to these diseases from 14.5 to 1.1 per 1,000 live births. In addition, immaturity and certain conditions originating in the perinatal period, and congenital anomalies now hold the two leading places as causes of death in this age group.

The death rate in children aged 1–4 years decreased from 4.6 per 1,000 to 1.0 from 1970 to 1980, and to 0.8 in 1987 and 1988. The leading causes of mortality in this group have evolved as those of infant mortality since 1970: enteritis and other diarrheal diseases moved from first to fourth place, dropping to one-twentieth of their previous rate; accidents and birth defects moved to first and second place, respectively. Mortality due to communicable diseases has progressively decreased since 1970.

Deaths in children under 5 years old as a percentage of total deaths in the population fell from 41% in 1970, to 17% in 1980, and to 13.3% in 1988. Severe and moderate malnutrition affected 2.9% of the population under 5 years old served by the Ministry of Health.

Mortality of the population aged 5 to 14 years has decreased from 0.9 per 1,000 in 1970, to 0.5 in 1988, and to 0.4 in 1986; this represents a reduction of 44% and 20%, respectively. In 1988, this rate was 0.27 per 1,000. The absence of deaths due to measles and the significant decline in mortality due to diarrheal diseases, which moved from third to ninth place, are noteworthy trends in the mortality causes in this group. Malignant neoplasms shifted from fifth to second place, and birth defects from seventeenth to fourth.

Health of Adolescents and Adults

In the population aged 15 to 64 years, the death rate declined from 3.3 to 2.3 per 1,000 inhabitants from 1970

to 1980; since the latter year, the decline has slowed, reaching 1.9 in 1988. Since 1970, chronic and degenerative diseases have predominated as causes of death in this group, but accidents rank first. Ischemic heart disease, suicide and self-inflicted injuries, malignant neoplasms of the stomach, and cerebrovascular disease are of particular importance.

In the 15–19-year-old age group, the female school drop-out rate and pregnancy and its consequences, such as abortion and low birthweight among children of adolescent mothers, represent major health problems. From 1980 to 1985, approximately 19% of deliveries and abortions attended to at Costa Rican Social Security Fund institutions were among persons under 19 years old. An estimated 30% of high-risk pregnancies occur in adolescents, 53% of pregnant adolescent women do not receive prenatal care, and 39% of children with low birthweight are born to adolescents. Another serious problem, especially in men, is sexually transmitted diseases; higher rates of gonorrhea, chancroid, and urethritis occur in this age group. In the last four years, the incidence of syphilis and gonorrhea diminished, possibly due to fear of AIDS and to educational campaigns for its prevention. The main causes of hospital discharges in this age group are related to pregnancy, delivery, and abortion; traumas; appendicitis; disorders of the genital organs; and birth defects. Studies show that alcoholism tends to begin primarily in this age group, as well as drug abuse and smoking.

Maternal mortality, which like infant mortality dropped significantly from 1970 to 1980 (from 1.0 to 0.2 per 1,000 births), has more or less held steady. Since 1970, complications of pregnancy, childbirth, and the puerperium, especially abortion, constitute one of the principal causes of death in this population group. Adolescents and mothers over 35 years old are at high risk; undesired pregnancies (especially in women with four or more children) also constitute a serious risk. In 1987, the main cause of maternal mortality was obstetrical pulmonary embolism, which displaced hypertension complicating pregnancy, childbirth, and the puerperium as the leading cause in 1985 and 1986. Fetal or placental problems, postpartum hemorrhage, and major puerperal infection were the second leading group of causes of maternal mortality. In 1986, complications of pregnancy, childbirth, and the puerperium remained in fourth place as a cause of death among women 15 to 49 years old.

In 1987, external causes of injury were the leading cause of death in the male population aged 15 to 49 years old, followed by malignant neoplasms and diseases of the heart. In the female population aged 15 to 34 years old, complications of pregnancy, childbirth, and the puerperium, constituted the leading cause of death, followed by neoplasms and external causes of injury. In the 35–49-year-old age group, neoplasms ranked first, followed by

complications of pregnancy, childbirth, and the puerperium, and external causes of injury. In the 50–64-year-old age group, neoplasms and diseases of the heart were the two leading causes of death for both sexes. In 1970, mortality in persons 50 and older accounted for 41.4% of all deaths, increasing to 61.4% in 1980 and to 68.9% in 1987. Since 1970, the principal causes of mortality in this group have been chronic and degenerative diseases.

Health of the Elderly

The death rate in the group aged 65 years and older, which was 62.2 per 1,000 in 1970, was 48.9 per 1,000 in 1987, and is estimated at 48.5 for 1988. The three leading causes of death in this group are diseases of the heart, malignant neoplasms, and cerebrovascular diseases. This age group shows the highest figures for consultation per inhabitant, with hypertensive disease, arthropathies, and diabetes mellitus ranking as the most common causes. The five most frequent causes of hospitalization are chronic obstructive pulmonary disease, ischemic heart disease, malignant neoplasms, diabetes mellitus, and ocular disorders, which account for 35% of all discharges. Malignant neoplasms, which in 1980 were the main cause of hospitalization, have dropped to third place.

Problems Affecting the General Population

In recent years, the country has experienced a massive influx of immigrants. Most are Central Americans fleeing from war, and they are characterized by rural origins, poor health and nutrition conditions, low educational levels, and unskilled labor experience. According to early 1988 data, this population numbers 160,260: 15,820 are scattered throughout the country, 7,440 live in refugee camps, 37,000 seek refugee status, and 100,000 have no documents. Immigration authorities estimate that the actual figure for undocumented persons is much higher, because many persons enter the country at sites where control is difficult. The immigrants who are recognized as refugees are settled in camps in rural areas.

Since 1986, the care of refugees has been coordinated among the Ministry of Health, the Costa Rican Social Security Fund, the Red Cross, and the General Directorate for Refugees, with the support of the United Nations High Commissioner for Refugees (UNHCR) and the participation of "Socorro Internacional." After two-and-a-half years, the refugees' living conditions, health conditions, and nutrition status have significantly improved. Infant mortality was reduced from 57.0 per 1,000 live births in 1986, to 23.7 in 1987, and to 15.4 in 1988. From January 1987 to December 1988, serious malnutrition was reduced 83.9%; moderate malnutrition, by 68.8%; and mild malnutrition, by 8.6%. Thus, only

14.3% of the population under 6 years old suffered from malnutrition by the end of 1988.

The greatest gains in the control of communicable diseases have been in diseases preventable by vaccination, whose incidence was reduced notably in the last two decades. No cases of poliomyelitis or diphtheria have been registered since 1973 and 1975, respectively. Although in 1986 and 1987 there was a measles epidemic, with 4,534 cases in 1986, in 1988 the number of cases fell to 358. Among the diseases of compulsory notification, the most frequent are acute viral disease of the respiratory tract, influenza, and infectious diarrhea, which in 1988 accounted for 58% of notifications.

In 1987, the average mortality rate due to diarrheal diseases was 1.28 deaths per 10,000 live births, as compared to 13.6 in 1970; in some cantons rates of 5.01 per 10,000 were observed. Although several water-borne diseases have declined, others, such as viral hepatitis, with a rate of 149 cases per 100,000 inhabitants, have increased.

The incidence of vector-borne diseases, which had declined up to 1982, has increased since 1983. The greatest problem is the risk of increase and spread of malaria cases, which in 1987 increased to 883, and in 1988 to 1,116, with a rate of 36 per 10,000 inhabitants. The annual incidence of malaria rose from 0.1 in 1983 to 0.32 in 1987, and showed a high proportion of imported cases. Although renewed transmission was checked in many areas, the timely detection of cases has been almost compromised. An additional effort has also been required to keep the country free of *Aedes aegypti*.

A total of 52 AIDS cases were registered in 1988, among them the first case of maternal transmission and the first case among intravenous drug-users. Given this, many institutions have coordinated their efforts, the adopted policy has been reviewed, and activities have focused on educational campaigns and on establishing the capability to perform laboratory diagnosis. In contrast, a decline in the incidence of the principal sexually transmitted diseases has been observed.

In September and October 1988, in the aftermath of Hurricane Gilbert, which came close to the country, and Hurricane Joan, which ravaged it directly, the country's southern area experienced serious floods that brought about major environmental contamination and, subsequently, Costa Rica's first epidemic outbreak of leptospirosis.

The country has had no cases of canine rabies since 1980, nor of rabies in man since 1970; however, rabies in bats is endemic, and its transmission has been detected in cattle. Although notification of brucellosis is compulsory, it is striking that very few cases are reported in man. However, in 1986 the laboratories of the Ministry of Agriculture and Livestock analyzed 9,884 samples of serum from different animal species: 290 were positive,

which means that there may be undetected cases in man or that there is underregistration of cases. The difficult health situation in neighboring countries has led to the mobilization of resources to prevent the introduction of diseases not found in Costa Rica or the reactivation of those which have been controlled to date.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

The 1973 National Health Law established health as a public good whose care is entrusted to the State; this responsibility is discharged by the executive branch through the Ministry of Health. All residents have the right to health services as determined by laws and special regulations and the duty to maintain their good health.

The 1983 National Planning Law established a National Planning System composed of three major subsystems: Administrative Reform, Regional Direction and Planning, and Sectoral Direction and Planning. Health, one of the social sectors, includes the institutions responsible for health activities. These institutions are under the responsibility of a Minister who is charged with defining policy for this sector and ensuring that its institutions reflect the objectives and guidelines set by administrative policy and reform. The National Sectoral Council, the Executive Secretariat for Planning, and the Technical Sectoral Committee lend support to the sector.

Health sector institutions have been organized and operate according to regionalization and sectorization criteria that aim at concentrating highly specialized services and decentralizing basic ones. The Ministry of Health is responsible for health promotion, disease prevention, and environmental health; the Costa Rican Social Security Fund (CCSS) is charged with health recovery and rehabilitation and contributes to the Ministry of Health's prevention and promotion activities. The National Insurance Institute (INS) is responsible for the care, rehabilitation, and compensation of all persons included in policies providing coverage for occupational hazards, as well as those persons covered by the compulsory motor vehicle insurance; the Costa Rican Institute of Water Supply and Sewerage is responsible for the drinking water supply and sewerage services. Universities and technical schools that train human resources also participate in one of the agencies that set direction for the sector.

Health policy in the 1970s pursued universal coverage through two basic strategies: the universalization of social security and the expansion of health services coverage, especially to scattered rural and marginal urban popula-

tions, through the primary care approach. The development of a National Health System constituted by the health sector's institutions has been determined as a political and technical need. Even though these institutions will retain their legal identity and their administrative independence, they must conform to uniform technical and administrative procedures when required. This concept presupposes coordinated planning of services, administrative coordination and budgetary consolidation at the regional level, and the provision of comprehensive services at the local level. In recent years, strengthening the operative capacity of local units and coordinating them to form local health systems (SILOS) have been initiated. Each of these local health systems is understood as a cluster of related sectoral and extrasectoral resources that are responsible for the health of a population in a given geographic area and who share epidemiological, demographic, sociocultural, economic, and political-administrative characteristics. Greater emphasis has been placed on those located in scattered rural areas and in the most marginal peripheral urban areas. Efforts have aimed primarily at defining ways and means for programming the local health systems, developing managerial capacity in order to deconcentrate human and technological resources and accounting and supply systems to the local level; designing managerial information systems that can support the management of local health systems; and establishing mechanisms that include community participation at the local and regional levels.

Production of Services

In 1970 there were 192,750 hospital discharges (111 discharges per 1,000 population): 18.5% in CCSS hospitals, 75.2% in Ministry of Health hospitals, and 6.3% in private hospitals. In 1987, there were 313,870 discharges. Of these, the CCSS hospitals served 96.3% of the hospital stays, and all others, 3.7%, with a rate of 112 discharges per 1,000 population and an average stay of 6 days, with averages ranging from 10 days in general medicine to 2.2 days in obstetrics.

In 1970, 64.5% of the medical consultations were at CCSS establishments, 32.8% at Ministry of Health facilities, and 2.7% at private entities. There was an annual average of two consultations per inhabitant. In 1987, 72% of consultations were attended to by the CCSS, 10% by private services, 8% by the Ministry, 6% by the medical services of private companies, 3% by the INS, and 1% by mixed sector care.

Installed Capacity

In 1970, the country had 51 facilities with beds and 348 without beds. Of the hospitals, 80% belonged to the

Ministry of Health, 8% to the CCSS, and 12% to private entities. Of the establishments without beds, 80.5% came under the Ministry and 19.5% under the CCSS.

This breakdown changed substantially after the 1973 law on the transfer of hospitals and after the construction of new facilities by the Ministry and the CCSS. In 1989, the country had 1,956 establishments, 1,669 of which came under the Ministry: 578 (35%) for nutrition; 140 (8%) for activities related to dentistry; and 951 (57%) for comprehensive health services. Of these comprehensive services, 494 (52%) are health posts, 325 (34%) are community health areas, 93 (10%) are health centers, and 39 (4%) are mobile medical care units. The CCSS had 29 hospitals: 9 (31%) national, 6 (21%) regional, and 14 (48%) peripheral, as well as 237 infirmaries for outpatient consultation. The Ministry's facilities and teams are less complex than those of the CCSS, since they are designed to provide outpatient and home care. The INS had 16 medical dispensaries, a central outpatient consultation office, and a rehabilitation center.

In 1970, the country had 7,008 beds (4 per 1,000 population), of which 2.2 per 1,000 were designated for the population aged 0 to 12 years old. Of the total, 70% were for short stays; 81% were Ministry of Health institutions, 15% were CCSS institutions, and 4% were private entities. In 1987, there were 7,173 beds, equivalent to 2.6 per 1,000 population, of which 1.3 per 1,000 were earmarked for children 0 to 12 years old; short-stay beds accounted for 74% of the total and long-stay beds for 26%. Of the total, 3% were in Ministry of Health establishments, 95% in those of the CCSS, and 2% in private entities. Based on methodologies for the technical evaluation of physical plant and equipment, it has been determined that 70% of the public works and hospital installations are functioning normally, 15% show slight deterioration, and 15% show marked deterioration.

Health Services Technologies

In 1988, the country had 127 pharmacies in the public sector and 304 in the private sector, 119 clinical laboratories, 16 specialized laboratories, 27 blood banks, and 38 radiology services distributed among six institutions in the sector: the Costa Rican Social Security Fund, the Ministry of Health, the National Insurance Institute, the Costa Rican Institute of Water Supply and Sewerage Systems, the Costa Rican Institute for Research and Teaching in Nutrition and Health, and the Institute on Alcoholism and Drug Abuse. There were 227 sets of x-ray equipment, of which 139 (61%) were in normal operating condition, 61 (27%) were defective, and 27 (12%) were inoperative. In the clinical laboratories, of 1,604 sets of equipment, 966 (60%) were found to be in normal

condition, 433 (27%) were defective, and 205 (13%) were inoperative.

The CCSS had 93% of the pharmacies, 57% of the clinical laboratories, 100% of the blood banks, and 94% of the radiology services in the country; 94% of the specialized laboratories came under the Ministry of Health.

In 1987, the CCSS dispensed a total of 21,528,200 drugs: 70% to outpatients, 9% to hospitalized patients, and 10% in emergency care. The number of clinical laboratory examinations carried out in that institution in 1987 rose to 11,622,300: 49% in outpatient consultations, 35% in hospitalization services, and 7% in emergency care. That same year, the institution carried out 692,130 radiological studies: 38% in outpatient consultations, 21% in hospitalization services, and 29% in emergency care. Blood banks supplied transfusions for 27,330 patients: 2% in outpatient consultations, 93% in hospitalization services, and 5% in emergency services.

The Ministry of Health has registered some 4,500 pharmaceutical products for human use. In addition, it monitors compliance with quality standards for the production of these products. Since 1982, the country has had a compulsory national drugs formulary for the public sector; it lists some 360 drugs in 520 presentations.

In 1987, the public sector spent almost \$US30 million on drugs, of which more than 90% was for the CCSS. In 1986, estimated expenditures for drugs purchased at private pharmacies rose to \$US30 million.

Although the country has 15 production laboratories, including 3 that belong to transnational companies, the public sector continues to import more than 60% of all drugs.

Financing of the Health Services

The main financing sources for the health sector are the national budget; quotas paid by the State, employers, and workers for social security; fees for services; taxes; income from the national lottery; and other sources.

In the early 1980s, reductions in health expenditures caused by the crisis ranged from 26.5% to 47.2%. Health expenditure as a share of total GDP, which had risen from 5.1% in 1970 to 7.9% in 1980, declined to 5.6% in 1982; it subsequently increased gradually, reaching 6.8% in 1988. In that last year, total expenditure of the sector broke down as follows: the CCSS, 69.6%; the Costa Rican Institute of Water Supply and Sewerage Systems, 14.3%; the Ministry of Health, 14.3%; and the National Insurance Institute, 1.8% (in its health benefits component).

In the CCSS, the increase in expenditures for outpatient consultations has outpaced that for hospital care, as a result of the deliberate channeling of resources to ambulatory services and to new models of health care.

Scientific Development and Health Technology

Health research has not been a priority in national development. Institutions that have developed a degree of infrastructure and technical capability in this field do not have common guidelines for or coordination in their work. A substantial share of research has focused on areas that are not among the sector's priority needs. There are 11 research centers distributed among the University of Costa Rica, the Ministry of Health, and the CCSS.

The production of health services relies heavily on sophisticated technology. In order to evaluate technological demand, an attempt has been made to strengthen existing ties with the Ministry of Science and Technology, the leading agency in this field. The major obstacles to the development of science and technology are: a lack of political guidelines and of a process for the comprehensive planning of needed research and technology; the limited financial resources allocated to research and to the transfer of technology; the failure of educational systems to emphasize habits and attitudes that encourage research; the fact that professional teams tend to work more in clinical practice and teaching, leaving scant personnel and effort for research and technology; the limited access to bibliographical sources; and the limited communication within the scientific community.

Human Resources

Without coordinated planning, manpower education and training in the health sector has not achieved a balance between the output of training institutions and the needs of the institutions employing such personnel. This has led to inequities in the supply and distribution of human resources, who are concentrated in the country's most developed areas. The lack of specific policies and guidelines for regulating various aspects of health personnel development contributes substantially to the inconsistencies among the education and training of this personnel, the ways in which they are used, the health needs of the population, and the country's health plans and programs. Health sciences education follows an eminently clinical orientation with a predominantly curative approach. There is no planned continuing education of health personnel at the different levels that responds to the demands of national health policy programs and that promotes learning in academic milieus that closely reflects the way in which services are provided.

In 1987, the health sector had 28,130 staff members working in three of the principal institutions: the CCSS (71%), the Ministry of Health (23.6%), and the National Insurance Institute (1.3%). Of CCSS and Ministry of Health staff, 37.9% were located at the central level, with

a greater proportion in the Social Security Fund (42.2%) than at the Ministry (22.6%). Total resources by type and ratio per 10,000 population had increased from 1970 to 1987, except for dentists and nurse auxiliaries (Table 1).

In 1987, 52% of the personnel performed administrative functions or functions related to general services and 48% provided direct care to patients.

TABLE 1

Health manpower per 10,000 population, by type, Costa Rica, 1970 and 1987.

| Type of resource | 1970 | 1987 |
|-----------------------------|--------------|------|
| Physicians | 5.2 | 8.1 |
| Dentists | 1.4 | 1.0 |
| Pharmacologists | 0.2 | 0.6 |
| Nurses | 4.0 | 5.1 |
| Nursing auxiliaries | 13.3 | 13.3 |
| Microbiologists | 0.5 | 1.1 |
| Sanitation inspectors | 0.6 | 0.7 |
| Rural health assistants | ^a | 1.7 |
| Community health assistants | ^b | 1.2 |

^a First training in 1971.

^b First training in 1977.

Of medical sciences professionals and paramedical personnel, 84.3% and 77.5%, respectively, worked for the CCSS, showing that a single public institution employs most of the personnel. A study carried out in mid-1985 identified the need to train in public health 537 sector staff members who worked in planning, programming, and standardization of services and in providing direction, advisory services, and supervision in program development. Of these, 5% are technical personnel and 95% are professionals. To overcome the shortcomings of training in public health, the University of Costa Rica, the Ministry of Health, and the CCSS have signed an agreement. The first graduate studies program in this field began in 1989.

HEALTH AND THE ENVIRONMENT

Costa Rica has made a major effort to fulfill the goals of the International Drinking Water Supply and Sanitation Decade, giving priority to its activities geared to the population that has not been sufficiently served and to less privileged groups, especially scattered rural populations and the urban marginal population. From 1980–1984 to 1985–1989, drinking water services were expanded from 84% to 93% of the population. In urban areas, the percentage of coverage was maintained at 100%, while in the rural areas it increased from 69% to 82%. Of the urban population, 100% had sewerage services, septic tanks, or sanitary latrines for the evacuation of excreta, and 88% of the rural population was covered by such services; this represents an increase in overall coverage to 95%, up from 87% in 1980.

The solid waste problem has been aggravated by the the growth of population centers and by industrial and commercial development. It is estimated that more than 1.5 million kg of waste are produced daily, of which 60% corresponds to urban localities and 40% to rural communities. Of the total, 16% is collected regularly, but with inadequate final disposal; and 54% is not collected at all, and thus accumulates indiscriminately.

Biological and chemical contamination and food decomposition and improper storage result in losses amounting to an estimated 35% of national production. To these direct economic consequences must be added the cost of medical care for and recovery of persons affected by food-related diseases. In recent years, a special effort has been made to combat this problem, and in 1987 deaths related to food poisoning were reduced 30%.

Environmental pollution also has worsened with industrial and population growth, especially in the urban areas. Agricultural and industrial growth, and particularly the indiscriminate use of pesticides, heavy metals, and other toxic elements, has resulted in additional contamination.

Many institutions share responsibility for the administration, protection, and improvement of the country's environment. In 1986, a conservation and controlled development national strategy was begun, with the participation of various economic and social sectors.

The incidence of labor accidents and occupational diseases has progressively risen; this represents a major economic burden in terms of compensation payments and medical expenditures, and has significant consequences on the family and the individual.

CUBA

GENERAL CONTEXT

Political, Economic, and Social Situation

The Republic of Cuba is a socialist State whose political and administrative structure was established by the 1976 Constitution. The country is organized into 14 provinces and 169 municipalities, one of which constitutes a special municipality.

The country's comprehensive development is governed by a National System of Economic Direction and Planning, which establishes the principles, subsystems, methods, and procedures through which planning, direction, and control of economic activities are conducted.

By 1987, most sectors of the economy had increased their share in the overall social product as compared with 1985. Table 1 presents some of the main economic indicators.

The average monthly wage in the productive sector has decreased in recent years, from \$189 in 1985 to \$182 in 1987. In the nonproductive sector, it increased from \$184 in 1985 to \$188 in 1987.

Radical changes in fishing, agriculture, and land use implemented during the revolutionary period have affected the population's nutritional status. Per capita caloric intake has risen, reaching 2,948 in 1988. From 1975 to 1980, egg production rose from 1.9 to 2.5 million, and milk production increased from 591 to 940 million liters. From 1975 to 1987, total State and private fruit production significantly increased, especially that of citrus fruits, whose production grew fivefold. In addition, Cuba is one of world's leading sugar producers. The distribution of some essential and relatively low-cost food items is controlled to guarantee their accessibility.

A basic national policy tenet holds that everyone should be provided for and that everyone should have the opportunity to study and work. There is a trend toward greater incorporation of women into the work force: 34.7% of women of working age (17 to 55 years old) were employed in 1980, 43.0% in 1985, and 44.4% in 1987. National university enrollment for the 1987-1988 academic year was 262,225, 55.6% of whom are women aged 17 years old and older. Most of these women are exclusively devoted to their studies.

Illiteracy, which affected 30% of the population before

| Indicators | 1980 | 1985 | 1987 |
|---|----------|----------|----------|
| Overall social product ^b | | | |
| In current prices | 17,605.6 | 26,904.1 | 25,556.4 |
| In 1981 prices | 19,110.8 | 27,069.7 | 26,350.3 |
| Overall per capita social product ^c | | | |
| In current prices | 1,810 | 2,664 | 2,481 |
| In 1981 prices | 1,965 | 2,683 | 2,558 |
| Monetary income of the population ^b | | | |
| Total monetary income of the population | 6,766.3 | 10,314.8 | 10,654.6 |
| Per capita monetary income of the population ^c | 696 | 1,021 | 1,034 |

^aCuba's national accounting is officially governed by the System of Balances of the National Economy recommended by the socialist countries' Council for Mutual Economic Assistance, also called the material product system by the Statistical Office of the United Nations.

^bMillions of pesos.

^cPesos.

Source: Cuba's Statistical Yearbook. State Committee for Statistics.

1960, has been eradicated. Enrollment in primary education includes 97.3% of the population 6 to 12 years old. Differences between provinces with the highest and lowest enrollment levels range from 2% to 3%. Enrollment in secondary education encompasses 92% of the young people in the corresponding age group. University graduates (those who have completed courses in higher education) numbered 26,022 for the 1984–1985 academic year, and 27,513 for 1986–1987. More than half the graduates in this last academic year were women, a situation that also is seen at other educational levels. In the 1987–1988 academic year, 29,282 scholarships were granted in primary education, 49,493 in secondary education, 122,190 in technical and professional education, and 61,655 in university education. Kindergartens are part of the educational system; they serve children aged 45 days to 6 years old. These kindergartens, together with student scholarships and an additional 451,008 places for part-time boarders that give food and some clothing to the students, have provided care for well over one million children in recent years, thus fostering the incorporation and permanence of women in the work force.

Insufficient housing has required a major construction effort in the 1980s. From 1981 to 1987, 465,190 masonry dwellings were built and supplied with water, electricity, and health services, as well as with other communal benefits. This figure includes housing built by construction companies, by other companies, and by the population itself, but does not include rural structures.

Migration from rural to urban areas and a slower rate of construction in the 1970s have led to some unsanitary neighborhoods in the capital and other major cities, even though this problem had been eliminated in the 1960s. In 1989, some of these neighborhoods emerged in Havana, and in them, 3% of the population lived (some 60,000 inhabitants). This phenomenon also has been observed on a smaller scale in the city of Santiago de Cuba. The problem has been assessed, and the eradication of these areas is projected for the next few years. Although the cities are not surrounded by belts of poverty per se, isolated clusters of unsanitary housing have appeared as a result of hasty settlement of workers in certain areas.

From 1981 to 1987, the network of roadways was expanded. Paved roads increased from 10,662 km in 1981–1985 to 24,440 km in 1987. Less than 5% of the population lives more than 5 km from a highway, road, railroad, maritime transport, or other means of transportation; this figure includes those living in mountainous areas, although they remain the most isolated populations in the country.

Demographic Characteristics

Cuba's population was more than ten million in 1988. Population density per km² rose from 89.2 in 1983 to

94.0 in 1988. Although population densities vary from area to area, there are no major differences. The proportion of urban population increased from 69.0% in 1981 to 72.3% in 1988.

The demographics structure has changed dramatically in the last 20 years. These changes reflect a substantial decline in the birth rate and the emigration of 403,015 people between 1964 and 1973 and of an additional 244,799 from 1974 to 1983. Migration among provinces was 16.9 inhabitants per 1,000 in 1983 and 17.6 per 1,000 in 1987. Owing to the personnel requirements for carrying out agricultural and industrial plans, displacement occurs mainly from the easternmost provinces to the western ones and from rural to urban areas.

Life expectancy at birth increased from 71.4 years in 1980–1985 to 72.2 years in 1985–1990 for males and from 75.2 to 75.8 years for females, respectively. Throughout the country's 14 provinces life expectancy ranges from 73.4 years in City of Havana to 75.7 years in Villa Clara; the rest have intermediate values.

The age distribution of the population shifted from 1983 to 1988: the population under 15 years of age declined from 28.1% to 23.7% of the total; the 15–64-year-old age group increased from 63.9% to 67.9%; and the population 65 years old and older increased from 8.0% to 8.4%. In the same period the male to female ratio fell slightly, from 102 to 101 males for every 100 females.

The most common family size in Cuba in 1987 was four persons, of which there were 567,907, followed by three-person families, with 551,017 and two-person families, with 449,143.

The birth rate rose from 14.1 live births per 1,000 population in 1980 to 18.1 in 1988. The gross figures for live births for these years were 136,900 and 187,911, respectively, with 98.5% born in health institutions in 1980 and 99.8% in 1988. The general fertility rate, or fertility per 1,000 women aged 15 to 49 years, was 56.3 and 64.1 for those same years.

ANALYSIS OF THE PRINCIPAL HEALTH PROBLEMS

General Mortality

Estimates based on the 1970 and 1981 national censuses confirm that registration of newborns is almost universal because they are registered in the health institutions before being discharged. This system was initiated in 1964 and became law in 1965. Along with registration, the child's identity document is delivered before discharge.

Regarding death certification, in 1968 health institu-

tion directors and chiefs of records and statistics were empowered to legally verify the certifying physician's signature. This measure increased the verifying offices from just over 100 to more than 600 and overcame the problem of inaccessibility that contributed to underregistration. The fact that funerals and burials in the country's cemeteries are free also helped improve the information's coverage and reliability. These measures required municipal government control of funeral parlors and cemeteries. Underregistration of deaths, which was 10% in 1960, was reduced to 0.5% in 1980.

The coverage and reliability of vital statistics have benefited from the built-in confirmation provided by death certification by both the Ministry of Justice and the Ministry of Public Health in each of the country's 14 provinces, by the initial coding at the province level and its subsequent review at the national level, and by the implementation of a certification for perinatal deaths since January 1973.

The ten leading causes of death did not change in the 1980s, though, as shown in Table 2, some have shifted in their relative position. The five leading causes account for nearly 70% of all deaths, and the ten leading causes represented approximately 80% of all deaths in both 1980 and 1988. In 1980, 76.8% of the deaths occurred in persons over 50 years of age and 60.1% in persons over 65. In 1988, these proportions were 79.9% and 63.9%, respectively.

If the rates are adjusted by age, using three-year averages instead of years as comparison periods and grouping violent deaths in a single category, slight changes in the rates of some of the leading causes of death are observed in the last three-year period. Also, it can be seen

that violent acts tend to take more lives among the young (Table 3).

Health Situation of Specific Population Groups

Child Health

Infant mortality rates decreased from 16.5 to 11.9 per 1,000 live births from 1985 to 1988, and in 1988, all but one of the provinces registered rates of fewer than 15 per 1,000 live births. By age groups, mortality in children younger than 7 days old fell from 8.1 to 6.1 per 1,000 live births; the rate in the 7–24-day-old age group fell from 2.1 to 2.0; and that of the age group 28 days old to 11 months old, from 6.3 to 3.8 per 1,000 live births.

The factors that influenced the decline of perinatal and infant mortality include a reduction in the low birth-weight rate from 8.2% in 1985 to 7.5% in 1988; the program to reduce infant mortality, which facilitates medical and nursing care and care provided by other specialties to both mothers and children under 1 year old wherever they live; the establishment of the family physician and nurse program in 1985, which has helped to improve primary care; the fact that more than 99.5% of children have been born in hospitals in recent years; implementation of the program for early detection of birth defects; and, finally, the establishment of a new program for perinatology that includes setting up perinatology rooms in the maternity hospitals and that has a maternal health component to improve care for pregnant women

| Groups of causes | 1980 | 1986 | 1987 | 1988 ^a |
|--|-------|-------|-------|-------------------|
| Diseases of the heart | 166.7 | 183.6 | 185.5 | 191.4 |
| Malignant neoplasms | 106.6 | 118.2 | 119.7 | 123.9 |
| Cerebrovascular diseases | 55.3 | 63.1 | 64.7 | 62.1 |
| Accidents | 38.0 | 42.8 | 43.6 | 48.5 |
| Influenza and pneumonia | 38.6 | 38.5 | 39.3 | 34.3 |
| Suicide and self-inflicted injury | 21.4 | 22.6 | 22.4 | 21.3 |
| Diabetes mellitus | 11.1 | 16.2 | 17.0 | 20.5 |
| Bronchitis, emphysema, and asthma | 7.0 | 7.3 | 7.7 | 10.1 |
| Certain conditions originating in the perinatal period | 13.2 | 9.6 | 10.8 | 9.5 |
| Congenital anomalies | 8.1 | 8.1 | 8.3 | 8.7 |

^aProvisional data.

| Groups of causes | 1982-1984 | | 1985-1987 | |
|--|-------------------|-------------------|-------------------|-------------------|
| | Rate ^a | YPLL ^b | Rate ^a | YPLL ^b |
| Diseases of the heart | 179.2 | 5.6 | 178.0 | 6.5 |
| Malignant neoplasms | 113.4 | 6.5 | 114.3 | 7.1 |
| Violent deaths | 67.7 | 19.0 | 70.6 | 20.8 |
| Cerebrovascular diseases | 57.6 | 2.2 | 60.6 | 2.4 |
| Influenza and pneumonia | 37.8 | 1.2 | 38.1 | 1.1 |
| Diabetes mellitus | 13.1 | 0.7 | 15.7 | 0.7 |
| Certain conditions originating in the perinatal period | 12.2 | ... | 10.0 | ... |
| Congenital anomalies | 8.4 | 1.3 | 7.9 | 1.3 |
| Bronchitis, emphysema, and asthma | 7.5 | 0.6 | 6.1 | 0.5 |

^aRates per 100,000 population, adjusted by the direct method taking as the typical population that of 1983.

^bYPLL from 1 to 64 years per 1,000 population.

(this has helped to bring about a better working relationship between the maternity hospitals and the general hospitals and has improved the neonatology equipment and rooms).

The five leading causes of death in children under 1 year old (Table 4) account for approximately 80% of total deaths in that age group.

The rate corresponding to certain conditions arising in the perinatal period diminished from 6.2 in 1987 to 5.2 in 1988, owing basically to reductions in anoxia and hypoxia, hyaline membrane disease, and other perinatal diseases.

Diarrheal diseases have been the leading cause of infant mortality for more than half of this century, and in 1970 continued to account for 5.5 deaths per 1,000 live births. By 1988, they represented only 321 deaths in the overall population, with a rate of 3.0 per 100,000 inhabitants

and accounting for 0.5% of mortality nationwide; 26.2% of the deaths due to acute diarrhea occurred in children under 1 year old. The number of consultations for acute diarrheal diseases did not follow this same trend.

The leading causes of death in the 1-4-year-old and 5-14-year-old age groups have remained unchanged for several years. In 1988, accidents ranked first in the 1-4-year-old age group, with a rate of 2.3 per 1,000, followed by congenital anomalies (1.1 per 1,000), malignant neoplasms (0.7 per 1,000), and influenza and pneumonia (0.5 per 1,000). In the 5-14-year-old age group, accidents were the leading cause of death, with a rate of 20.4 per 1,000, followed by malignant neoplasms, with 5.0 per 1,000, congenital anomalies (3.5 per 1,000), meningococcal infections (1.6 per 1,000), and diseases of the heart (1.0 per 1,000).

The determination of anthropometric measures ac-

| Groups of causes | 1985 | 1986 | 1987 | 1988 |
|--|--------------|------|------|------|
| Certain conditions originating in the perinatal period | 5.9 | 5.9 | 6.2 | 5.2 |
| Congenital anomalies | 3.4 | 3.3 | 3.0 | 3.0 |
| Influenza and pneumonia | 1.7 | 1.1 | 1.1 | 0.9 |
| Enteritis and other diarrheal diseases | 1.1 | 0.6 | 0.7 | 0.5 |
| Accidents | ^a | 0.4 | 0.4 | 0.3 |

^aNot among the five leading causes in 1985.

ording to weight-for-height percentile was introduced into the National System of Nutritional Surveillance in 1984. The results are shown in Table 5.

The nationwide program for nutritional surveillance of children under 5 years old is facilitated by the numerous pediatric consultations throughout the country. Children above percentile 90 or below percentile 10 are considered at risk and are followed up. There are few apparent cases of malnutrition, and in general they are secondary or associated with specific social and familial problems.

Newborns with low birthweight are kept in the neonatology services until they reach the necessary weight for life without risk at home.

Health of Adolescents and Adults

Maternal mortality has decreased from 5.3 deaths per 10,000 live births in 1980 to 2.6 in 1988. A reduction of deaths associated with hemorrhages and infections related to cesarean sections and the closer working relations between the maternity hospitals and the intensive care units of the clinical-surgical hospitals played an important role in the 1987 reduction.

Mortality in the 15–64-year-old age group represented almost 30% of the deaths from 1985 to 1988. Slightly less than half of these deaths occur in the 15–49-year-old subgroup.

In 1988, accidents were the leading cause of death, beginning with 1-year-olds and up to 50-year-olds. The second cause in the age group 15–49 years old was malignant neoplasms, followed by suicide, diseases of the heart, and cerebrovascular diseases. From ages 50 to 64 years, the leading cause of death is diseases of the heart, followed by malignant neoplasms, cerebrovascular diseases, accidents, and diabetes mellitus; the last is most common among women.

Chronic diseases have shifted to the leading places as causes of death in the age groups 15–49 years old and 50–65 years old. Diseases of the heart and malignant

neoplasms rank second and fourth in the 15–49-year-old age group, with rates of 21.1 and 25.4 per 100,000 population, respectively, and first and second in the 50–64-year-old age group, with rates of 268.1 and 252.6 per 100,000 population, respectively. Accidents occupy first place in the 15–49-year-old age group, with a rate of 42.7 per 100,000 population, and fourth place in the 50–64-year-old age group, with a rate of 48.3 per 100,000 population.

Health of the Elderly

The percentage of deaths in the age group 65 years and older increased from 61.8% of the total in 1985 to 63.9% in 1988. The causes of death for persons 65 and over represent the causes of death for three-fifths of the population. Since the order has remained unchanged throughout the 1980s, 1988 has been used as a model year (Table 6).

The five major groups of causes of death mentioned in Table 6 account for 78.6% of mortality in this age group. Nearly 80% of deaths from diseases of the heart are due to ischemic diseases, and these show higher rates for men.

The most frequent sites of malignant neoplasms are the trachea, bronchia, and lung, with 30.0 deaths per 100,000 population and much higher rates in men. Neoplasms of the digestive system, as a subgroup, follow (oral cavity, pharynx, esophagus, stomach, sigmoid colon, and rectum). Neoplasms of the prostate, breast, and uterus also are important.

Arteriosclerosis is the basic cause in 94% of deaths due to diseases of the arteries, arterioles, and capillaries; 77% of these deaths occur in persons 75 years and older. If multiple causes are studied, these groups of causes frequently combine with hypertension and diabetes mellitus.

A study done by the Cuban Institute for Research and Orientation of Internal Demand showed that smoking has declined in nine provinces and increased in five. The

| Percentiles | 1984 | | 1988 | |
|-------------|----------------------|------------------|----------------------|------------------|
| | Less than 1 year old | 1 to 4 years old | Less than 1 year old | 1 to 4 years old |
| Below 3 | 2.1 | 0.5 | 1.1 | 0.3 |
| Below 10 | 5.3 | 0.8 | 4.1 | 0.6 |
| Above 90 | 6.0 | 1.6 | 4.9 | 0.9 |
| Above 97 | 2.6 | 1.0 | 1.6 | 0.5 |

TABLE 6

Number of leading causes of death and rate per 100,000 population 65 years and over, Cuba, 1988.

| Groups of causes | Deaths | Rate |
|---|--------|---------|
| Diseases of the heart | 15,443 | 1,753.5 |
| Malignant neoplasms | 8,274 | 939.5 |
| Cerebrovascular disease | 4,756 | 540.0 |
| Influenza and pneumonia | 2,946 | 334.5 |
| Diseases of the arteries, arterioles, and capillaries | 2,700 | 306.6 |

lowest figure for smokers in the population over 13 years of age in 1988 was in City of Havana, with 34.1%, and the highest was in the province Sancti Spiritus, with 49.9%.

Problems Affecting the General Population

There has been a progressive reduction of morbidity due to infectious and parasitic diseases in all age groups, particularly among children, as well as an increase in the chronic and degenerative diseases as life expectancy has increased. Table 7 shows the trends for some infectious diseases.

In the years studied, there were no reported cases of diphtheria, neonatal tetanus, human rabies, autochthonous malaria, or poliomyelitis.

The reduction of diseases preventable by vaccination is tied to the high vaccination coverage, which is more than 88% nationwide for the age groups and educational levels studied.

TABLE 7

Incidence rate of certain notifiable diseases (per 100,000 population), Cuba, 1980, 1987, and 1988.

| Disease | 1980 | 1987 | 1988 |
|--------------------------|-------|-------|-------|
| Typhoid fever | 1.0 | 0.7 | 0.9 |
| Tuberculosis | 11.6 | 6.1 | 5.9 |
| Tuberculous meningitis | — | 0.0 | — |
| Leprosy | 3.1 | 3.4 | 2.8 |
| Whooping cough | 1.3 | 1.0 | 0.3 |
| Tetanus | 0.3 | 0.1 | 0.0 |
| Measles | 38.9 | 8.3 | 1.2 |
| Meningococcal meningitis | 4.4 | 5.5 | 5.1 |
| Gonorrhoea | 168.4 | 353.2 | 371.7 |
| Syphilis | 44.7 | 84.3 | 82.4 |

Meningococcal meningitis type B persists as a problem, although it has recently begun to decline; incidence in 1986 was 6.9 per 100,000 population. Systematic vaccination with a new vaccine produced in the country, whose efficacy is estimated at 70%, is being carried out.

Sexually transmitted diseases have risen and receive special attention. As of June 1989, 308 seropositives had been detected for the AIDS virus in 4,748,731 persons examined. Initial testing included high-risk age groups, Cuban personnel who served in different continents, and sailors; testing has been extended to the general population, in which positivity is much lower (0.007%).

In 1988, the prevalence of some diseases was estimated using the population served by health area polyclinics as a reference group. The following rates per 1,000 population were found for areas with and without family physicians, respectively: arterial hypertension, 32.7 and 60.9; bronchial asthma, 16.1 and 36.7; and diabetes mellitus, 13.2 and 16.9.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

Cuba has a unified, comprehensive, and decentralized system for providing health care to the population. The regulatory agency is the Ministry of Public Health, which is charged with setting standards and providing coordination and control. The Ministry encompasses eight vice-ministries. One corresponds to the First Vice-Minister and the rest deal with the following areas: medical care, hygiene and epidemiology, medical education, science and technology, services, economics, and pharmaceutical industry. Each vice-ministry includes several offices for covering more specific matters. The Ministry of Public Health directly serves research institutes, medical institutes and medical schools, some national hospitals, and the national production and distribution of drugs.

The provincial and municipal health offices are administered by the provincial and municipal people's power assemblies (local governments); the latter allocate budgets, nonmedical supplies, work force, and maintenance. Technically, they come under the Ministry of Public Health. This structure ensures executive and budgetary decentralization and creates the conditions for effective intersectoral coordination as a way to cope with the population's health problems. Each province and the special municipality, Isla de la Juventud, are considered a local health system. The only exception is City of Havana, which has a high population density concentrated in a

fairly small geographical area. These characteristics, along with an extensive health services network that includes facilities of all levels, several research institutes with highly specialized services, and national reference hospitals, allow for the conformation of several local health systems within City of Havana; these are organized using the municipal level structure as a framework.

The unified health system also pursues the following principles: planning the system's development and improving the population's health; considering preventive medicine as the basis of development; providing free medical care and ensuring full access to services for the entire population; monitoring scientific advances and putting them into practice; promoting participation of the population in health activities; and providing any possible assistance to other countries in need.

Since 1984, the basic transformation of the national health system has involved the implementation of a new primary health care model through the Family Physician Program. In this program one physician and one nurse are assigned to 120 to 160 families (600–700 persons). The work of this team, complemented by one psychologist and one health promoter from the Federation of Cuban Women, is characterized by the comprehensive care given to the population. The team focuses on the family as a work unit and relies on health education, health promotion, and prevention as its basic strategies.

In 1988, there were 6,211 family physicians, who provided coverage to 37% of the country's population. From the 1989 mid-year graduating class, 2,540 physicians had been trained for this function; they will increase coverage to 45%. At the outset of the 1989–1990 academic year, the future physicians, who will cover nearly 100% of the national population by 1995–1996, will be between their first and sixth academic years. These physicians constitute the cornerstone of primary care. The polyclinics are transforming their organizational structure in order to coordinate services, education, research, and the exchange of consultation information between specialists and family physicians. The polyclinics also provide diagnostic methods and auxiliary services; as such, they are becoming the "school" of family physicians.

The family physician works closely with hospitals and with other secondary and tertiary health institutions. This gives the population total access to drug distribution and allows a closer follow-up of chronic patients, a more immediate health education, total immunization, prevention of risk factors, and environmental control at the community level. This program functions in the workplace, schools, kindergartens, the merchant marine, and agricultural and livestock cooperatives, in order to reach people at work and at school.

Of the various forms of community participation in health tasks, the most important are those of the Fed-

eration of Cuban Women (FMC) and of the Committees for Defense of the Revolution (CDR). The first includes more than three million women and the second has 6,400,000 members; in both groups members must be over 14 years old. The most effective participation of the FMC is through volunteer health promoters, whose ranks have grown from 56,535 in 1980 to 58,237 in 1988. In the latter year, they carried out 2,421,331 field visits, 42.8% of which were related to the maternal and child program's care for pregnant women and newborns; 18% with the program for the prevention of cancer of the cervix; 10.5% with the immunization program; and the rest dealing with other health problems such as those of diabetics and hypertensives. Since 1962, the CDR have administered the oral poliomyelitis vaccine and have handled volunteer blood donations, an activity in which they began to participate more than 25 years ago with 20,000 to 30,000 donations per year and that reached 605,057 in 1988. These health activists coordinate joint health activities between the population and the health centers and orient the population on health education and problems, but they do not treat, diagnose, or administer drugs.

Installed Capacity and Production of Services

In 1988, the country had 7.0 beds per 1,000 population, of which 5.3 were for medical care and 1.7 for social assistance. In addition, there was one stomatology unit for every 2,240 inhabitants, and 1.3 stomatologists per unit.

In recent years, a program for expanding and modernizing pediatric hospitals was implemented—31 rooms for intensive therapy were built, pediatric polyclinics at the hospitals were built and expanded, and new services were created and their equipment modernized.

The Rural Social Medical Service was renewed as the network of rural hospitals was refurbished and their equipment improved. The "Piti Fajardo" detachment of medical students was created; its members carry out internships in rural areas.

New techniques for diagnosis were introduced, such as ultrasound throughout the hospital network, computerized axial tomography at highly specialized centers, and, more recently, nuclear magnetic resonance and the hyperbaric chamber. Innovative technologies also have been acquired and implemented, such as noninvasive lithotripsy for the treatment of kidney stones.

Six new cardiac care centers were distributed throughout the country; in 1988, 1,717 surgical procedures were performed. The ophthalmology program has continued to grow. Techniques such as vitrectomy, microsurgery, phacoemulsification, ocular ultrasound, ultraocular len-

ses, computerized tonometry, use of laser, specular microscopy in cornea transplants, and surgery for nearsightedness have been introduced. A center was established for serial ocular microsurgery.

The program for early prenatal detection of birth defects has been extended nationwide. It seeks to detect such defects as Down and other trisomy syndromes, defects of the neural tube, some malformations detected by ultrasound, and problems arising when both parents are carriers of the sickle-cell trait. The program's genetic consultations orient parents so that they can freely decide whether they desire to interrupt pregnancy. There are also programs for the detection and treatment of congenital hypothyroidism in newborns and for early detection and treatment of phenylketonuria.

Medical consultations per capita increased from 5.9 in 1985 to 6.5 in 1988; stomatologic consultations held steady at about 1.5 during that period. Consultations for children under 1 year old rose from 17 to almost 20 per child; almost 60% of these had to do with pediatric care. In addition, in 1985 and 1988 there were some 5 consultations per capita annually for children 1 to 4 years old, and approximately 2 consultations per year for the 5–14-year-old age group. There were an average of 12.8 prenatal consultations per delivery in 1985 and 14.6 in 1988. In 1985, there were 1,608,551 hospital admissions, or 16 admissions per 100 population; in 1988, there were 1,610,592, or 15.5 admissions per 100 population. The decrease in the rate of admissions is linked to the home care provided by family physicians to patients who otherwise would have been admitted to the hospital.

Financing of the Health Services

The health system is financed entirely by the government budget. Table 8 shows regular expenditures and investments from 1985 to 1988; Table 9 shows the trend of social security expenditures.

| Regular expenditures and investments, in millions of pesos, Cuba, 1985–1988. | | |
|---|----------------------|-------------|
| Years | Regular expenditures | Investments |
| 1985 | 794.3 | 105.5 |
| 1986 | 875.2 | 177.7 |
| 1987 | 922.5 | 229.2 |
| 1988 | 978.9 | 291.8 |

HEALTH AND THE ENVIRONMENT

Water availability has been a national problem for many years. In 1959, the country had 13 dams, representing a total storage capacity of 47.8 million m³; in late 1987, there were 105 dams with a capacity greater than 5 million m³ and a total capacity of 7.03 billion m³. These dams, along with hundreds of others with a capacity of under 5 million m³ located in agricultural, livestock, and industrial areas of the country, are helping to solve the problem.

By late 1988, water supply systems served 6,728,200 residents (65% of the national population); 82% lived in urban areas. Of the water provided by these systems, 92.5% is treated with chlorine. Beginning in 1980, national production of chlorine and its derivatives increased, and the bacteriological quality of the water improved. The monthly bacteriological testing of water for human consumption is an ongoing service of the country's network of sanitary and epidemiological services. The Cuba/UNICEF Program for the construction of rural water supply systems and water fluoridation efforts also have been emphasized in recent years, and some communities that have been studied have shown a percentage reduction of dental caries in the served population.

The Program for Standards of Community Hygiene sets sanitary requirements for drinking water, water supply sources and systems, and hydraulic and sanitary installations for dwellings and public buildings.

In 1988, 37% of the urban population (2.8 million inhabitants) had sewerage services. This percentage does not fully reflect the sanitary condition of this population, since all the dwellings in areas without sewerage have individual liquid waste collection systems. All new settlements have sewage treatment plants, and plants are under construction in several major cities.

In 1983, a national survey was carried out to assess the environmental pollution from the disposal of industrial and agricultural wastes and of waste produced by human communities; public health criteria were adopted to solve existing problems. Systematic sanitary studies of water pollution are carried out as a part of the sanitary control work of the Program for Environmental Health. More than 100 large industries and sugar mills have solved or are working to solve water pollution problems caused by their waste.

Traditionally, collection services have been offered primarily in the large urban centers and, except in City of Havana, using open trucks; all final disposal sites were open cut spillways. In the last five-year period, solid waste collection services have been extended to 95% of the urban population; they also have increased in the rural population. Control of waste collection, transportation, and final disposal has been extended to the entire country.

| TABLE 9 | | | |
|---|-------|-------|---------|
| Social security expenditures, in millions of pesos, Cuba, 1980, 1985, and 1987. | | | |
| Benefits | 1980 | 1985 | 1987 |
| Total | 709.3 | 965.2 | 1,136.6 |
| Old-age, total disability, and death pensions | 541.5 | 764.1 | 930.6 |
| Disease, accident, and maternity subsidies | 97.6 | 149.2 | 147.0 |
| Partial disability pensions | 0.5 | 3.7 | 15.2 |
| Supplementary | 4.9 | 4.1 | 4.2 |
| Social welfare benefits | 22.2 | 34.0 | 38.8 |
| Others ^a | 42.6 | 10.1 | 0.8 |

^aAccording to legal provisions, from 1985 to 1987 life annuities have been gradually assimilated by the old-age, total disability, and death pensions.

Source: State Committee on Labor and Social Security.

Work is under way to eliminate and relocate spillways, decreasing their number near population centers, fencing them in, and building small structures for the personnel in charge of control. The Program for Community Hygiene Standards implements sanitary requirements for storage, transportation, and final disposal of solid waste. The country has 23 sanitary landfill systems located in each provincial capital and in other important cities.

Each province has an air pollution surveillance system which conducts surveys on air pollution sources and participates in surveillance and control through REDAI-RECUBA, which has 32 stations in the principal cities and regions. Since 1980, more than 250 surveillance sites

for particulates and other chemical pollutants have been established. Air pollutant levels are not considered critical; some areas of City of Havana have exceeded the maximum concentrations allowed at certain times of the year.

Indiscriminate deforestation left almost 90% of the country affected by erosion, changes in the water cycle, and other ecological problems. Reforestation efforts began in 1960; as of 1969 more than 506.9 million conifers and dozens of broadleaf species such as cedar, mahogany, calaba, and eucalyptus were planted. From 1970 to 1979, 499.4 million trees were planted; and from 1980 to 1987, 884.9 million had already been planted as part of a plan that is expected to continue for a long time.

DOMINICA

GENERAL CONTEXT

Political, Economic, and Social Situation

The Commonwealth of Dominica is a Republic within the Commonwealth of Nations. The head of state is the President, who has some executive functions. The Head of the Government is the Prime Minister, who appoints the Cabinet, which, in turn, is responsible to the Parliament. Elections are held at not more than five-year intervals.

Dominica's economy is still recovering from Hurricane David's devastation in 1979. The gross domestic product (GDP) doubled between 1983 and 1987, from a total of \$US65.1 million to \$US129.6 million. Per capita GDP increased from \$US850 in 1983 to \$US1,630 in 1987.

One-third of the economy is based on agriculture. The GDP attributed to agriculture doubled between 1983 and 1987, increasing from \$US19.4 million to \$US38.8 million. Banana production contributes significantly to the agricultural sector. Throughout 1983–1987, international trade balances were negative and inflation remained low; the external debt was \$US66 million in 1987. Unemployment in 1989 was high, at 18.4%. Adult literacy was reported to be 95% in 1987, with nearly all children aged 5–15 years old enrolled in schools.

The Government has pursued structural adjustment policies that increasingly emphasize the development of agricultural and manufacturing export potential. Although tourism is being promoted, it is not as important to Dominica's economy as it is for other Caribbean islands.

Demographic Characteristics

The last census was held in 1980; the population grew from 76,500 in 1983 to 79,700 in 1988. The population structure is basically young, with 38.4% under the age of 15 and only 7.2% over the age of 65 in 1983.

Between 1984 and 1989, Dominica maintained a steady birth rate of 21.4 per 1,000 population, with a 5% reduction in the actual number of births from 1,721 in 1986 to 1,644 in 1987. During this period, fertility

rates also fell to below 100 per 1,000 women 15–44 years old (93.4 per 1,000 in 1986) after being sustained at over 100 for the previous five years. Births to women under 20 years of age accounted for one-quarter (24%–27%) of total births.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

In 1984, the leading causes of death were heart disease (390–429), with 119 deaths (151.6 per 100,000 population); malignant neoplasms (140–208), with 72 deaths (91.7); cerebrovascular disease (430–438), with 35 deaths; certain conditions originating in the perinatal period (760–779), with 31 deaths; and other diseases of the respiratory system (466, 480–519), with 23 deaths. Other important causes of death were diabetes mellitus (250), with 19 deaths, and transport accidents (E800–E848), with 9 deaths. Of the 119 deaths from heart disease, 53 were due to hypertensive disease.

The infant mortality rate leveled off at 18 per 1,000 live births with the prevailing pattern of dominance by the neonatal component: 25 out of 32 infant deaths in 1985, 19 out of 26 in 1986, and 21 out of 30 in 1987. There was, however, a steady rise in the stillbirth rate from 7.6 in 1985 to 13.9 in 1987. No particular explanation is available for this.

Immunization coverage in the under 1-year-old age group has been sustained at over 90% for DPT and poliomyelitis and at 86% for measles.

There were 9 deaths of children 1–4 years old in 1985, 11 in 1986, and 6 in 1987.

Adolescent health has been receiving closer attention, and services have been extended to more of the health centers; family life education has become a part of the school curriculum.

The school health program has been strengthened, and the responsibility for screening falls largely on the cadre of family nurse practitioners. Preschoolers come under the care of health visitors.

Cardiovascular diseases are the main causes of mortality among adults (15–64 years old). Hypertension, the greatest contributor to heart disease, is the most common chronic noncommunicable disorder and, together with diabetes, accounts for a high proportion of clinic visits.

Forty percent of the patients with diabetes also have hypertension. The stomach is among the most frequent sites for cancer in both sexes; prostate cancer in males and cervical cancer in females also occur frequently. An increase in the number of traffic accidents has led to the inclusion of accidents among the ten most common causes of death. A nationwide cervical cancer screening program has been launched.

During 1985–1987, there were four maternal deaths, for an overall maternal mortality rate of 7.8 per 10,000 live births. Maternal and child health has benefited from increases both in attendance at postnatal clinics and in the number of women accepting family planning services.

A mental health program instituted in the mid-1980s emphasizes the community approach; the primary health care system, which is effectively utilized throughout the island, facilitates the implementation of this program.

The elderly population is projected to reach 10% of the total population by the year 2000. Heart disease, cancer, and cerebrovascular disease are the main causes of death. Blindness, a leading disability among the elderly, is increasingly the result of chronic glaucoma and diabetic retinopathy.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services System

Responsibility for providing public health rests with the Department of Health within the Ministry of Education, Health, Sports and Youth Affairs. Policy decisions for the health services are made by the Minister on the advice of Senior Technical Officers and of the Permanent Secretary, who is responsible for the daily administration of the Department. The Minister is responsible to the Cabinet of Ministers for the provision of government health services.

Technical responsibility for the health services lies with the Chief Medical Officer. After Hurricane David's devastation, on August 29, 1979, the need for reconstruction and development of the services made it necessary to employ a Health Services Coordinator, who answers directly to the Permanent Secretary and advises the Minister as appropriate on the technical aspects of health services development.

In order to provide the Ministry with an expanded capability to manage health service delivery efficiently and effectively, administrative changes were implemented during 1985–1988. The reorganization process eliminated the vertical lines of command that previously governed the programs and substituted a team approach at

all levels of the Department of Health. To implement this new approach three levels of responsibility have been identified: policy making level, program formulation level, and program execution level. The decentralized organization and management of community-based services is the most striking feature of these administrative changes.

Health care delivery has been facilitated by the division of the island into seven health districts. The district is the key level in the primary health care system and serves as the base for local programming, management, supervision, and financial control. At this level, programs proposed by the central level are analyzed and adjusted to suit the specific needs of the community.

Primary care services are functionally organized by districts, and care is delivered by a health team, which includes all health workers at the district level. The team is managed by a committee composed of the district medical officer, health visitor, environmental health officer, and family nurse practitioner. The team is responsible for health care delivery in preventive, promotional, curative, and rehabilitation services. In each district, the resident medical officer functions as the team manager/leader, except for the health district that serves the capital city, Roseau, where the team is led by a pharmacist. Program delivery and team functioning are guided by established norms and standards and are also supported by various manuals of procedure.

The reorganization of the health system and, in particular, of the primary health care services, has influenced the need and demand for efficient services delivery at the main referral hospital. During 1986 and 1987, organization focused on strengthening the networking of the health system, the primary health care services, and the outpatient services at the main hospital, the Princess Margaret Hospital.

The National Health Plan (1982–1987) describes the delivery system as a network of primary health care units (type I clinics) that serve a minimum population of 600 and within a radius of five miles. This health care delivery system is composed of four levels of care. In order of ascending complexity of care and services offered, these are: type III clinics, a proposed polyclinic, and a national referral hospital.

The least complex level, the type I health clinic, is the smallest unit at the peripheral level in the community and represents the first point of contact of the individual with the health system. Services provided at this clinic are closely integrated in the community. Each clinic is staffed by a primary care nurse/district nurse and serves a minimum population of 600 persons within a five-mile radius. For every four or five type I clinics at level one, a health center (type III clinic) provides supervision and support. The second level of complexity, represented by type III health centers that constitute the administrative

headquarters of the district, caters to the population in its immediate vicinity (over 2,000); with the aid of type I clinics, these centers generally serve a total population of more than 7,000. Care at this center covers limited maternity inpatient services, outpatient referral services, dental services, supervisory support to level one, and environmental health services.

The 140-bed Princess Margaret Hospital, located in Roseau, remains as the single main referral institution. Although the structure of the wards has not changed since their construction in 1962, a new utility block presently near completion will house dietary, laundry, central sterilization, supplies, and maintenance services.

A polyclinic (Roseau Resource Centre), whose construction on the hospital grounds began in 1986–1987, will provide offices for administration and health services. When completed, the polyclinic will provide the third level of care.

The Princess Margaret Hospital also provides care at the fourth level. This institution provides inpatient services for general medicine, general surgery, pediatrics, obstetrics, gynecology, and psychiatry.

In 1987, there were no private hospitals and four government-owned hospitals, with a total of 322 beds. The number of beds per type of institution and the bed ratio per 10,000 population are shown in Table 1.

Approximately 98% of the population has no health insurance. Primary care services and hospital services are free to all social security card-holders, children, and persons recommended by the welfare division.

HEALTH AND THE ENVIRONMENT

Dominica is a rocky mountain chain that runs from north to south, and has inland forests and waters and no white sand beaches. The country has plentiful surface water, but water quality suffers from chemical contamination, deforestation, and waste discharges. The Roseau water treatment facilities are incomplete, and chlorination facilities are not dependable.

Roseau is the only community with sanitary sewers. However, eight or nine outfall sewers discharge raw sewage on the beaches and coastline. Some suburban areas have undersized sewers and some have no sewers. Many other housing areas have no septic tanks or properly functioning privies, causing serious sanitation problems.

Solid waste litter in towns and dumping in the countryside are commonplace; landfill disposal sites are rare. The net result is that the solid waste management program is inefficient and enjoys limited public participation.

The key structural problems are weak institutional ca-

TABLE 1

Hospital beds and ratio of beds per 10,000 population, by type of institution, Dominica, 1987.

| Type of institution | Beds | Ratio |
|-------------------------------|------|-------|
| Main general | | |
| Roseau | 140 | 18 |
| Marigot | 16 | 18 |
| Portsmouth | 36 | 36 |
| Psychiatric | | |
| Princess Margaret | 40 | 5 |
| Central geriatric institution | 90 | 12 |

pability in water and sewerage; shortage of financial, manpower, and other resources; and lack of land-use planning and development controls.

A Canadian International Development Agency project is now geared to strengthen the organization and resources of the water agency; when this project is completed in 1990, it will take over responsibility for sewerage sector development and operation (now with the Ministry of Health). When the Roseau sewerage studies project (funded by UNDP and the Caribbean Development Bank) is completed on January 31, 1990, it will provide preliminary designs and estimates for sewerage system improvements in Roseau.

New environmental health legislation has been drafted and will soon be enacted and enforced. This includes an enabling law and relevant regulations.

Due to the growing appreciation for the public's role in environmental management, the Government named 1989 the Year of Environment and Shelter. This effort aims at increasing the public's interest in environmental matters.

The vector control program is fully integrated into the primary health care system, although no regular vector-control activities are carried out. Control measures are undertaken by the environmental health officers as and when required. Source reduction, health education, and biological control (particularly of anophelines) are actively promoted. A community-based, integrated approach to *Aedes aegypti* control is being developed on a pilot scale, supporting the program through 1990. A PAHO spot check survey in 1989 gave a house infestation index of 94% in one of the proposed project communities.

DOMINICAN REPUBLIC

GENERAL CONTEXT

Political, Economic, and Social Situation

The Dominican Republic has a civilian, democratic, representative government which encompasses an executive branch headed by the President of the Republic, a legislative branch constituted by the Congress, and a judiciary branch which includes the supreme court, the court of appeals, and other courts.

The country is divided into three regions (the Southwest, the Southeast, and Cibao) and seven subregions, which are made up of 29 provinces and the national district (Santo Domingo, the national capital). The provinces are subdivided into 136 municipalities and municipal districts, which in turn are subdivided into 648 sections, each of which has a number of *parajes*, or rural districts. The census defines the national capital, the provincial capitals, and the seats of municipalities and municipal districts as urban areas; sections and *parajes* are considered rural. The Ministry of Public Health divides the country into eight health regions which correspond to the seven subregions and the national district. The health regions are subdivided into areas, each of which corresponds to a province.

The 1987–1990 national development plan places priority on remodeling and construction of health centers, hiring of new staff, and implementing mass immunization and clean-up campaigns and programs for popular pharmacies, maternal and child health, rural health, and nutrition, among others.

Up until the mid-1970s the economy was based on traditional export products (sugar, coffee, cacao, and tobacco). Sugar represented 44.1% of export earnings and accounted for more than 70% of industrial employment and more than 45% of the economically active population. In 1975 sugar accounted for 64.4% of the total value of exports. Beginning in the second half of the 1970s, the value of traditional exports declined substantially; from 1984 to 1987 all agricultural exports accounted for 21.5% of total exports and sugar for 9.9% (although sugar continued to provide more than half the industrial jobs).

The gap left by traditional exports has been filled by the services sector, especially industrial free trade zones

and tourism, which from 1977 to 1986 grew at an annual cumulative rate of 18.5%, while exports of goods had a negative growth of -0.86% (nominal values in \$US).

Three distinct periods can be traced in the Dominican economy from 1968 to 1986:

- *Period of concentrated growth (1968–1977)*. This period coincided with a policy of import substitution and a time of relatively plentiful foreign exchange that made it possible to finance imports of raw materials and capital goods. The manufacturing industry almost doubled its share of per capita GDP, as did construction, trade, and transportation.

- *Period of induced demand (1978–1981)*. The first response to the drop in external demand was to increase public spending through domestic indebtedness (1978–1980) and, later, through foreign debt (1981). The foreign debt rose from \$US1.38 billion in 1978 to \$US2.55 billion in 1981. Agricultural and industrial production stagnated and the balance of trade progressively deteriorated.

- *Period of induced depression (1982–1986)*. In 1986, the external debt reached \$US3.525 billion. The national currency was devalued (the average annual exchange rate rose from \$RD1,464 in 1982 to \$RD2,905 in 1986) and new taxes were levied to finance public spending. Real wages fell, while the cost of food significantly increased. Unemployment rose to 27.2% of the economically active population in 1985. Adjustment policies led to reduced social and health expenditures, although external resources earmarked for health increased considerably. School enrollment, which had increased until 1983–1984, declined in 1985–1986. The currency devaluation and the decline in real wages fueled the development of tourism and the industrial free trade zones, and these sectors increasingly became economic magnets.

The current situation appears to be temporary. Hereafter, increased public spending should be financed with indebtedness or with taxes on products not generated by the State, which is under pressure to privatize the production of goods and services. Furthermore, the investment incentives for tourism and for the industrial free trade zones are tax exemptions and guarantees of a high rate of return for investors, leaving no assurance that the resources generated in that sector will be plowed back into the Dominican economy.

In 1986 and 1987 there was an upturn in the GDP, sparked mainly by the boom in the construction industry, and the per capita GDP increased by 5.7%, from \$RD492.7 to \$RD520.7 (in 1970 values). The Central Bank's provisional figures indicate that in 1988 the GDP experienced a negative growth of -1.4%. Real per capita spending for social services and for health and social welfare increased, although in 1988 health and social welfare spending was still below the 1984 level, as shown in Table 1.

| Year | Implemented budget (\$RD) | Expenditure (\$RD) | |
|-------------------|---------------------------|--------------------|---------------------------|
| | | Social services | Health and social welfare |
| 1980 | 187.2 | 63.0 | 23.4 |
| 1982 | 152.4 | 57.1 | 23.2 |
| 1984 | 133.0 | 53.5 | 20.8 |
| 1985 | 139.4 | 47.1 | 18.2 |
| 1986 | 148.7 | 50.5 | 18.5 |
| 1987 | 182.0 | 64.3 | 18.6 |
| 1988 ^a | 180.3 | 68.4 | 20.4 |

^aEstimate based on 11 months of budget implementation.

Demographic Characteristics

The population increased from 894,665 in 1920 to 6.8 million in 1988, and the population density went from 11.5 inhabitants per km² to 142.2. Average annual population growth declined from 3.0% in 1960-1970 to 2.9% in 1970-1981 (from 6.0% to 5.3% in urban areas, and from 1.4% to 1.0% in rural areas). This drop reflects the effects of rural and urban family planning programs and of emigration. It is estimated that fertility declined from 6.7 children per woman in 1965-1969 to 3.7 in 1983-1985. Net migration out of the country in 1985-1990 has been estimated at 78,500 persons.

The birth rate has decreased in recent years, and is estimated at 31.3 per 1,000 population for 1985-1990. The Southwest Region, considered the least developed, has had the greatest decline in fertility.

In 1988 the male to female ratio was 103:100. Of the total population in 1988, 57.2% lived in urban areas. The population of the national district increased by 5.4% a year between 1970 and 1981, and it accounted for 32.2% of the total population in 1988. This is the only

health region whose percentage of the total population increased from 1970 to 1988.

In 1980, 42% of the population was under 15 years of age, but it is estimated that by 1988 this group had declined to 38.6%. Median age went from 17.8 years in 1980 to 20.2 years in 1988, and it is projected to reach 23.2 years by the year 2000. Life expectancy at birth for 1985-1990 was estimated at 65.9 years (63.9 for men and 68.1 for women); for the year 2000 it is projected to be 69.0 years (66.8 for men and 71.4 for women).

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

The underregistration of overall mortality is estimated at 40.3% for 1980-1985. According to available data for 1985, 13% of registered deaths were not medically certified (in 1966 the figure was 75.1%) and 15% of the diagnoses were classified as "signs, symptoms, and ill-defined conditions." Registered morbidity corresponds only to diseases for which reporting is compulsory, and registration suffers from coverage and quality shortcomings.

The overall death rate is estimated at 7.5 per 1,000 for 1980-1985, a decline from 8.4 per 1,000 in 1975-1980. Table 2 shows the death rates per 1,000 population ac-

| Period | Rate according to: | |
|-----------|--------------------|----------------------|
| | Register | ONE/CELADE estimates |
| 1960-1965 | 7.0 | 14.7 |
| 1965-1970 | 6.7 | 12.1 |
| 1970-1975 | 5.6 | 9.8 |
| 1975-1980 | 4.7 | 8.4 |
| 1980-1985 | 4.5 | 7.5 |

ording to the vital statistics record and to estimates from the National Office of Statistics (ONE) and the Latin American Center of Demography (CELADE).

The main causes of death (Table 3), in descending order, are: diseases of the heart, conditions originating in the perinatal period, malignant neoplasms (which show an upward trend), cerebrovascular diseases, and

| Cause diagnosed | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
|---|--------|--------|--------|--------|--------|--------|
| Total deaths recorded | 24,959 | 24,743 | 26,589 | 26,542 | 28,236 | 27,844 |
| Ill-defined conditions | 7,051 | 6,305 | 5,709 | 4,522 | 4,053 | 4,130 |
| 1. Heart diseases (390–429) | 3,193 | 3,243 | 3,582 | 3,859 | 4,474 | 4,535 |
| 2. Certain conditions originating in the perinatal period (760–779) | 2,280 | 2,432 | 2,663 | 2,718 | 2,897 | 2,735 |
| 3. Malignant neoplasms (140–208) | 1,254 | 1,441 | 1,590 | 1,709 | 1,843 | 1,760 |
| 4. Cerebrovascular disease (430–438) | 892 | 1,074 | 1,236 | 1,352 | 1,622 | 1,726 |
| 5. Accidents (E800–E949, E980–E989) | 950 | 1,064 | 1,241 | 1,500 | 1,644 | 1,667 |
| 6. Pneumonia and influenza (480–487) | 795 | 653 | 703 | 264 | 821 | 1,176 |
| 7. Cirrhosis of the liver (571) | 522 | 575 | 662 | 690 | 829 | 816 |
| 8. Diabetes mellitus (250) | 280 | 387 | 443 | 492 | 540 | 573 |
| 9. Congenital anomalies (740–759) | 301 | 349 | 422 | 445 | 363 | 447 |
| 10. Bronchitis, emphysema, and asthma (490–493) | 302 | 280 | 387 | 351 | 409 | 409 |
| 11. Measles (055) | 224 | 70 | 81 | 56 | 121 | 156 |
| 12. Suicide (E950–E959) | 110 | 114 | 133 | 167 | 149 | 133 |

Source: Division of Statistics. Ministry of Public Health and Social Welfare.

accidents (which show a sharp upward trend). This ranking is affected by differential underregistration, so it should be interpreted with caution.

The disease most frequently reported as a cause of morbidity is gastroenteritis. The many reports of dysentery, typhoid and paratyphoid fever, and hepatitis, and the high prevalence of intestinal parasitoses all demonstrate the importance of waterborne and food-borne diseases, as well as deficiencies in basic sanitation.

Health Situation of Specific Population Groups

Child Health

In 1985, deaths in children under 1 year of age accounted for 23% of all recorded deaths (in 1960 this figure was 38%). The underregistration of child deaths has been estimated at approximately 55%, with regional differences ranging from 38% to 83%. The infant death rate obtained through demographic surveys was 68 per

1,000 live births in 1985, with the highest infant mortality in the national district (Region 0) and in Region I, rather than in Regions IV and VI, which are usually considered the poorest. Table 4 shows the rates estimated by several surveys.

The decline in infant mortality over the last 15 years is attributed to the high degree of coverage with control technologies such as oral rehydration, mass vaccination, and others, since, as stated above, overall living conditions deteriorated markedly in that period. Most of this decline was in postneonatal mortality, and it was more pronounced in rural areas. According to recent estimates, the infant death rate in Santo Domingo is greater than 60 per 1,000 live births. Recent official studies conducted in the national district estimated this rate at 70.3 per 1,000 live births for the poorest segments of the population and 34.6 for the middle and upper strata, with marked differences according to the educational level of the mother and a high risk of death for premature infants (474.8 per 1,000).

At the national level, more than 40% of deaths among children under age 1 in 1985 were due to perinatal causes.

TABLE 4

**Estimated infant mortality rates, by areas and regions,
Dominican Republic.**

| Regions | NFS ^a 1971-1975 | NFS ^a 1976-1980 | DHS ^b 1983-1985 |
|---------------|-------------------------------|-------------------------------|-------------------------------|
| Country total | 98 | 85 | 68 |
| Urban area | 94 | 76 | 69 |
| Rural area | 102 | 91 | 66 |
| Regions | | | |
| 0 | ... ^c | 71 | 78 |
| I | ... ^c | 88 | 82 |
| II | 103 | 75 | 69 |
| III | 98 | 82 | 61 |
| IV | 114 | 101 | 68 |
| V | 74 | 95 | 60 |
| VI | 164 | 103 | 68 |
| VII | 91 | 90 | 69 |

^a National Fertility Survey, 1975, 1980.

^b Population and Health Survey, 1983-1985.

^c In 1975, Regions 0 and I were a single region.

Sources: Population and Health in the Dominican Republic. Population and Health Survey, 1986.

Other important causes diagnosed were infectious intestinal diseases, respiratory infections, congenital anomalies, and meningitis.

Mortality in the 1-4-year age group has declined progressively; in 1985 this group accounted for 7.0% of registered mortality, with a rate of 2.7 per 1,000 population. This group has greatly benefited from the reduced incidence of diseases preventable by vaccination, as well as from the promotion of oral rehydration therapy. Despite this, the principal causes of mortality diagnosed in 1985 in this age group were: infectious intestinal diseases, corresponding to 22.6% of all deaths; diseases of the respiratory tract, 21.5%; and nutritional deficiencies, 12.6%. These three groups of causes accounted for 56.7% of the deaths diagnosed in 1985 in this age group.

Various surveys have estimated that more than 40% of children under age 5 at the national level have some degree of malnutrition. However, the methodologies have not been comparable, and the reference population has not always been clearly explained.

The Population and Health Survey of 1986, using the population of the National Center of Health Statistics of the United States of America as a reference population, conducted a survey based on a national representative sample of 1,843 children from 6 to 36 months of age. The results for weight-for-age and height-for-age showed that the surveyed children weighed less and, in particular, were shorter than the reference population. According to

the parameter used, 12.5% and 20.8% suffered from severe malnutrition (less than 2 standard deviations) and 37.1% and 45.7% had moderate and severe malnutrition (less than 1 standard deviation).

Beginning in 1980, the incidence of diseases preventable by vaccination declined abruptly, reflecting the effort carried out by the Ministry of Public Health. In 1987 and 1988 there were no confirmed cases by wild poliovirus, even after the improved surveillance for the disease. For the past few years, the incidence of measles has held steady at approximately eight cases per 100,000 population; during 1988 and 1989 surveillance and preventive activities were intensified.

The incidence of non-neonatal tetanus has remained at approximately 1 per 100,000 population from 1980 to 1988. Neonatal tetanus, which in recent years had a rate of less than 4 per 100,000 estimated live births, increased significantly to a rate of 15.4 in 1988. On the other hand, whooping cough and diphtheria rates declined considerably in 1987, to 2.2 and 1.2 per 100,000 population, respectively. Despite efforts to increase the vaccination of newborns with BCG, coverage is still too low to have a significant epidemiological impact.

Diarrheal diseases and acute respiratory infections accounted for 28% of the deaths registered in children under 1 year and 44.1% of deaths in children 1 to 4 years of age in 1985. A national survey carried out in 1987 among children ages 0 to 4 years found that 40% of those studied had had acute respiratory infections and 27% had suffered from acute diarrheal diseases in the two weeks prior to the survey (of the latter, 51% had received oral rehydration). These two causes accounted for 94% of the episodes of disease found. There were, on the average, seven diarrheal episodes per year, lasting an average of five days each.

Health of Adolescents and Adults

Mortality in the 15-29-year age group has held steady at approximately 1.0 per 1,000 population from 1975 (1,618 deaths, for a rate of 1.18) to 1985 (1,890 deaths, for a rate of 0.97). In 1985 the leading cause of death for males was accidents and for females diseases of pulmonary circulation and direct obstetric causes. In 1984 tuberculosis was the leading cause of death diagnosed in women ages 20 to 34 and the second in men of the same age group, surpassed only by accidents.

In the 35-59-year age group the leading causes of death diagnosed were cancer, ischemic heart disease, and cerebrovascular disease. However, the frequency of tuberculosis and cirrhosis of the liver remained high in this age group (the fifth and the seventh leading causes diagnosed). Of all the deaths registered in 1985, 42.5% were in persons aged 60 and over; the leading causes

were cardiovascular diseases, cerebrovascular diseases, and acute respiratory infections.

The principal sites of neoplasms diagnosed as causes of death in 1980–1985 were: the intestine (except for the rectum), the prostate, the stomach, the lung, the trachea and the bronchia, and the uterine cervix. The rising trend of cancer in the last site is a priority problem among women.

In 1985, maternal mortality stood at approximately 1 per 1,000 registered live births. If this rate is calculated using the estimated number of live births based on the anticipated birth rates for each five-year period as the denominator (ONE-CELADE estimates), this figure is 0.5 per 1,000 estimated live births. Some experts consider that the real rate is at least double the registered rate.

In the country's main maternity hospital, the maternal death rate was 1.7 per 1,000 live births from 1980 to 1984. Toxemia, infection, and hemorrhage are the leading causes of maternal mortality; cesarean sections are the risk factor most associated with sepsis (up to 54% of all deaths attributable to sepsis) and abortions rank second. Official data cite national level rates of 12% for cesarean sections and 9% for abortions; however, there are reports estimating that in some of the public and private institutions as many as 50% of deliveries are cesarean sections. These studies point out that 54% of deliveries nationwide were attended by physicians. Prenatal control coverage has been estimated at 66% overall, with 30% of all pregnancies covered by the public sector.

In 1988, 31% of deliveries in public sector institutions were to mothers under 20 years of age. Public sector coverage of family planning was 18.2% of all women of reproductive age. Actual coverage is much greater, since many private institutions offer these services in marginal rural and urban communities. Of the users, 39% were surgically sterilized (5,052 sterilizations); 43% used oral contraceptives; 12%, intrauterine devices; and the rest, other methods.

Problems Affecting the General Population

Since 1983, when the Program for the Control of Sexually Transmitted Diseases and AIDS (PROCETS) was organized, the number of AIDS diagnoses has increased each year. By the end of 1988, 821 cases had been reported and there were an estimated 1,250 cases in all. Of these cases, 70% are in heterosexuals. The incidence of syphilis and gonorrhoea has declined.

In 1988 there was a major outbreak of dengue; 220 cases were confirmed by laboratory diagnosis, four of which were classified as dengue hemorrhagic fever.

Registered malaria has declined considerably since

1982 (4,654 cases), although there have been some significant periodic outbreaks, particularly in the southwest. These are frequently related to seasonal migrations of workers and the operational difficulties encountered in adopting control measures. In 1988, 1,072 cases of malaria were registered through microscopic diagnosis.

Urban rabies also has declined considerably, especially since 1987 when mass vaccination of dogs was resumed in urban areas, with an estimated annual coverage of 70% of the dogs. There are foci of rabies, particularly in mon-gooses.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

Pursuant to the policy objectives set forth by government authorities for 1986–1990, priorities have been: the recovery of installed capacity and the satisfactory financing of the national services network; the guarantee of an adequate provision of supplies, equipment, and drugs to the health establishments; the provision of sufficient physicians, nurses, and other personnel to health services; the expansion of services coverage; the strengthening of the child survival plan and the health promotion of mothers and children; the intercountry cooperation with Haiti on control programs for malaria, rabies, and sexually transmitted diseases and on the EPI; the promotion of intersectoral coordination with the Ministry of Agriculture for food and nutrition programs; the mobilization, promotion, and training of staff in the Ministry of Public Health and Social Welfare; and the reorganization and rationalization of the structure of the Ministry and its establishments.

The Ministry of Public Health and Social Welfare is the state agency that orients health actions in the public sector. It is composed of a central political-technical and regulatory level; a regional level (eight health regions) that directs, supervises, and controls; and the health area level, which is basically operational.

Services are provided on the basis of a ranked structure of institutions that includes a first level constituted by rural clinics and health promoters and supervisors; a second level consisting of health subcenters and local and area hospitals; and a third level corresponding to the regional and national hospitals.

The health promoters represent a broad informal system, with each promoter responsible for some 60 dwellings. In 1987 there were 5,275 promoters, with one supervisor for every 10 to 15 promoters. The promoters

are assigned to the rural clinics, and their activities are linked to vaccination campaigns. Beginning in 1988 a retraining process was undertaken within the child survival plan in order to expand its activities.

The Dominican Social Security Institute (IDSS), which is governed by a Board of Directors, offers coverage to salaried workers regardless of their wages and to private-sector employees whose weekly salaries do not exceed \$RD70.00 for the following: illness, maternity, disability, old age, death, and work-related accidents. Coverage upon death is restricted to a single indemnity, which is paid only when death occurs as a result of disease or a work-related accident. Family coverage is restricted to obstetric care and to children under 1 year of age. There is no unemployment insurance. Public servants covered by civil pensions and retired members of the military and the police are exempt from the Compulsory Insurance Program. Affiliation for domestic workers has been suspended since 1954.

The Armed Forces and National Police Social Security Institute (INSFAPOL) covers all members of the Armed Forces and their families. The Dominican Red Cross works in emergencies and disasters and in recent years has increasingly participated in the development of blood banks. The National Council on Population and the Family studies demographic issues and advises the Ministry and other institutions on the formulation and implementation of population policies. In addition, the Council contributes to extend the coverage of the family planning services provided by both public and private institutions.

The nonprofit private sector covers a high percentage of tertiary care needs in many medical specialties. Of note are the institutes of dermatology, rehabilitation, cardiology, oncology, ophthalmology, and diabetes; the Social Commission against Drug Addiction; and numerous institutions, many linked to religious organizations, concerned with children, family planning, and the promotion of health in rural and marginal urban areas.

The for-profit private sector offers predominantly curative and individual services in clinics and medical offices which are concentrated in the two largest cities. Because of a considerable growth in the private insurance industry, some middle class and wage-earning sectors have access to these services.

Production of Services and Installed Capacity

From 1984 to 1986 the number of hospital beds declined, and, according to an evaluation carried out in the same period, there was a marked deterioration of installations and equipment. Some 90% of incubators, 75% of x-ray equipment, 75% of laboratory equipment, and

50% of autoclaves were not functioning. In 1987 the Ministry of Health reported that approximately 70% of hospital equipment was in disrepair. That year, a program to restore hospitals and clinics was launched, which made it possible to increase the number of available beds; this trend continued in 1988. Increases also were seen in the number of consultations per person, in hospital discharges per 1,000 population, in occupancy rates and average length of stay, and, especially, in bed turnover (Table 5).

In 1988 the Ministry had 41 general hospitals, 6 specialty hospitals, 68 health subcenters, 2 public health centers, 422 rural clinics, and 67 urban clinics, in addition to 60 medical offices and health posts and 15 dispensaries, for a total of 7,577 beds.

IDSS had 1 maternity hospital, 15 general hospitals, 20 polyclinics, 13 urban medical offices, and 128 rural medical offices, for a total of 1,168 beds (in addition to some 32 beds in private institutions); it renders 4.38 consultations per beneficiary/year and issues 111.8 discharges per 1,000 beneficiaries/year. The number of consultations per beneficiary has decreased in recent years relative to 1983 (4.38 in 1987 compared to 6.25 in 1983). Declines also have been seen regarding the number of discharges per 1,000 beneficiaries (111.8 in 1987 compared to 168.2 in 1983).

INSFAPOL has 2 general hospitals, 2 polyclinics, and 57 dispensaries, with a total of 580 beds. The private sector has some 4,876 hospital beds, 75% of which are located in the country's two main cities. There are no estimates of the number of discharges or consultations.

In general, the country has a shortage of public sector hospital beds (it has approximately one bed per 1,000 population), and the deficit in outpatient care is greater still (one consultation per inhabitant/year for the entire health system). In addition, the use of installed hospital capacity is also deficient, with occupancy rates at approximately 60% and bed turnover at 45 discharges per year (Table 5).

The low utilization in the period studied may have to do with the above-mentioned deterioration of facilities. The many small hospitals and the subcenters with beds experienced particularly low levels of utilization, which may be due to the limited problem-solving capacity at these levels of care when it comes to dealing with problems that require hospitalization and to the short distances and good means of communication.

Regarding the use of curative services, a survey of more than 1.5 million people conducted in Santo Domingo determined that 23% of residents are affiliated with or are beneficiaries of IDSS, private insurance companies, or INSFAPOL; 73% (63% excluding those with high incomes) are neither affiliated with nor beneficiaries of any of the closed systems. Of the total number of people

| Year | Consultations (per person) | No. of beds (per 1,000 population) | Discharges (per 1,000 population) | Average days of stay | % occu- pancy | Bed turn- over |
|------|----------------------------------|--|---|----------------------------|---------------------|----------------------|
| 1984 | 5,186,357 | 7,402 | 286,313 | 4.6 | 50.8 | 38.7 |
| | (0.83) | (1.18) | (45.7) | | | |
| 1985 | 4,288,803 | 6,509 | 280,206 | 4.7 | 55.9 | 43.1 |
| | (0.67) | (1.0) | (43.7) | | | |
| 1986 | 4,285,355 | 6,486 | 241,916 | 3.4 | 35.1 | 37.3 |
| | (0.65) | (0.99) | (36.9) | | | |
| 1987 | 5,842,207 | 6,604 | 280,206 | 4.0 | 58.0 | 45.0 |
| | (0.87) | (0.98) | (41.7) | | | |

Source: Department of Statistics, Ministry of Public Health and Social Welfare.

who needed medical consultations in the two weeks prior to the survey, 32% were members and beneficiaries of closed systems, while 66% (55% excluding those with high incomes) were not affiliated with any such system. Of the latter, almost half had resorted to private care, and 46% of those requiring hospitalization had opted for the private sector. On the other hand, some of those served by Ministry services did have insurance, were affiliated with IDSS, or had high incomes.

In sum, there is a large unmet demand in the lower-income sectors and in those not affiliated with IDSS or

other insurance schemes. Coverage of promotion and control programs is limited. Public sector activities, except for mass vaccination campaigns and some activities under the child survival plan, were limited to meeting the spontaneous demand of the population.

Human Resources

There has been an increase in health manpower. The Ministry increased its personnel both at the primary level

| Region/Subregion | Physicians | | Nursing personnel | |
|-------------------|------------|-------|-------------------|-------|
| | No. | Ratio | No. | Ratio |
| Country total | 3,256 | 5.7 | 10,550 | 15.4 |
| Cibao Region | 1,251 | 4.9 | 3,440 | 13.6 |
| Central Cibao | 608 | 4.0 | 2,181 | 14.5 |
| Eastern Cibao | 339 | 4.8 | 888 | 12.7 |
| Western Cibao | 304 | 9.1 | 371 | 11.4 |
| Southwest Region | 353 | 4.4 | 969 | 11.9 |
| Enriquillo | 154 | 5.1 | 430 | 14.5 |
| Valle | 199 | 4.0 | 539 | 10.4 |
| Southeast Region | 1,652 | 4.7 | 6,141 | 17.5 |
| Valdesia | 1,489 | 5.2 | 5,359 | 18.5 |
| National District | 1,013 | 4.6 | 4,488 | 20.2 |
| Other provinces | 476 | 7.1 | 871 | 13.0 |
| Yuna | 163 | 2.6 | 782 | 12.5 |

Source: Ministry of Public Health and Social Welfare, Yearbook, 1988; Status of Nursing in the Dominican Republic, 1989.

and overall. There are 5.7 Ministry physicians per 10,000 population (1,800 inhabitants per physician), not including interns. If interns are included, the ratio is 7.0 per 10,000 (1 per 1,400 population).

The country has 10,550 nurses (15.4 per 10,000 population), but 85% are auxiliaries or practitioners with limited training (Table 6).

HEALTH AND THE ENVIRONMENT

In the context of the International Drinking Water Supply and Sanitation Decade, the goals for 1990 are: to supply drinking water to 70% of the urban population through house connections and to 33% of the rural population, and to provide sewerage service to 35% of the urban population. By 1987 these goals were far from being met: only 49.2% of the urban population had connections to the water supply system and only 22.7% had sewerage services. Untreated sewerage is discharged into watercourses and the sea. The water supply is frequently interrupted. In recent years this has been aggravated by electricity shortages, which interrupt the pumping system.

Water quality is inadequate. In evaluations done in 1986 in eight health regions, 34% to 57% of the samples

taken did not meet WHO standards. However, the evaluations were not conclusive because the number of samples was too small. A plan to build drinking water systems is currently being implemented.

The collection and disposal of solid waste has obvious shortcomings that have led to many "microdumps" in streets and untended lots, to clogging of the sewerage system, and to the spread of rodents, flies, and other vectors.

In some urban areas, industrial discharges of gases, fumes, and particulates need to be controlled; some watercourses are polluted by mining and industrial discharges. The indiscriminate use of pesticides in agriculture has caused difficulties for the exportation of plants and fruits, but it has not led to restrictions on the distribution of products for domestic consumption, which is not adequately controlled.

Neither food safety and control activities nor programs for the control of food-borne diseases are well-developed, which is linked to the high rate of diarrheal and parasitic diseases in the population, the high mortality and morbidity in children under 5, and the higher infant death rates found in urban areas.

A research project on ciguatera (fish poisoning) was recently begun, as well as a health project for school-children that focused on food-handling practices in the home.

ECUADOR

GENERAL CONTEXT

Political, Economic, and Social Situation

Ecuador is a democratic and unitary state. Its government is republican, presidential, elected, and representative. The legislative branch is embodied in the National Congress; it is located in Quito and is composed of 67 national and provincial representatives. Executive branch duties are discharged by the President of the Republic, who serves as head of state for a four-year term, and by the Cabinet of Ministers (currently there are 12 Ministries, including the Ministry of Public Health). The Sectional System, which operates under the executive branch, is constituted by a governor in each province (except Pichincha, where those functions are performed by the Ministry of Government), a political chief in each canton, and a political lieutenant in each parish. The governors and political chiefs are appointed by the President, and the political lieutenants are designated by the Ministry of Government. Justice is administered by independent entities: the Supreme Court of Justice, with the Superior Courts and their Courts and Tribunals; the Fiscal Tribunal; the Administrative Law Tribunal; and other courts and tribunals established by law.

At the regional and local level, and within the Autonomous Sectional System, there are provincial and municipal councils. The former, based in the provincial capitals and presided over by the Provincial Prefect, work for the province's progress in collaboration with central agencies. The municipal councils are responsible for each canton. In those provincial capitals and other cities that meet the demographic and budgetary requirements set by law, each municipality is presided over by a mayor. The provincial and municipal councils are functionally, economically, and administratively independent.

Ecuador has vast resources, especially in agriculture, but the country is experiencing a severe economic crisis. The gross domestic product (GDP) grew at a cumulative annual rate of barely 0.6% from 1984 to 1987, from 153.4 billion sucres (in constant 1975 sucres) to 156.2 billion sucres. This was mainly due to the suspension of oil exports for six months due to damages to the oil pipeline caused by the March 1987 earthquake. Commerce and finance made the single largest contribution

to the GDP, followed by manufacturing industries, forestry, and fishing and game; these three areas accounted for 64.1% of the GDP.

Foreign trade in goods and services from 1984 to 1987 was very unfavorable; total exports grew initially and then dropped to a cumulative annual rate of 5.7%. In contrast, total imports grew steadily (cumulative annual rate of 5%).

The result was an overall deficit of \$US2.19 billion during the period, with a cumulative annual growth of 68%.

Per capita GDP declined from 17,249 sucres (constant 1975 currency) in 1984 to 16,174 sucres in 1987, reflecting the deterioration in the purchasing power for basic goods and services and in the standard of living, especially for the popular sectors. From 1984 to 1987 inflation increased at a cumulative annual rate of 28%. In February 1989, according to estimates of the National Institute of Statistics and Censuses (INEC), annual inflation was 90.9%; the highest sectoral inflation occurred in the food and beverages category, with 107%.

Unemployment increased from 10.5% in 1984 to 10.8% in 1987, but recent official estimates put unemployment at 13% of the economically active population, or some 400,000 persons. Of even greater concern is the underemployment rate of 50% of the economically active population, or approximately one million people. In 1982, the minimum wage could buy 64.5% of the family basket; by 1985, this proportion had dropped to 51.8%.

Illiteracy stood at 13.8% in 1984 and at 12.7% in 1987. Primary school and the basic cycle of secondary school are compulsory. Although primary school enrollment is satisfactory, the retention rate (the ratio between the number of students enrolled in the sixth grade in 1987 and those enrolled in first grade five years earlier) was barely 57%; this figure was even lower in rural areas. Enrollment in secondary school, both at the basic and diversified cycles, has been increasing. In 1987, the retention rates were 75% in the basic cycle and 69% in the diversified cycle. Enrollment in state universities is free. There are 18 universities and 3 polytechnical, fiscal, and private schools.

One of the country's most serious problems is the quantitative and qualitative deficit in housing. Its causes are structural and are closely tied to population growth. According to the 1982 census, there were 1.8 million dwell-

ings, which translated into a deficit of 690,000 housing units. In 1986, there were approximately 2.1 million dwellings, and an estimated deficit of 885,000 units.

Demographic Characteristics

The country's population increased from 4,476,000 inhabitants in 1962, to 6,557,000 in 1974, and to 8,060,700 in 1982, according to data from the respective censuses. The INEC estimates and projections indicate that the population rose to 9,922,500 in 1987 and to 10,203,700 in 1988, and that it will reach 12,314,200 in 1995. The annual rate of increase was 3.2% for 1962–1974, declined to 2.8% annually from 1970 to 1982, and is estimated to drop to an annual rate of 2.7% for 1985–1990. With no large-scale emigration, this slowdown in population growth is attributed primarily to the decline in the birth rate (41.2 per 1,000 population from 1970 to 1975; 35.4 per 1,000 from 1985 to 1990) and to the reduction in the death rate (11.2 per 1,000 population and 7.55 per 1,000 for the same periods). These demographic trends affect the age structure of the population, leading to a significant increase in the age group 15 to 64 years old. However, currently the population is young: those under 15 years of age constitute 40% of the total, while no more than 4% is 65 years and over. Life expectancy at birth is estimated at 65.4 years for 1985–1990.

An increase in urbanization and the settlement of new lands have led to an excessive population concentration in a few cities and to an emergence of scattered small rural settlements; the trend toward urban concentrations outpaces that of the scattered settlements (Table 1).

Through the years, the white, Indian, and, to a lesser extent, the black population groups have mixed. Only some Indian communities maintain their separate identities; their ideology, culture, and manner of interpreting, treating, and preventing disease differ significantly from the rest of the country. Currently, nearly 40% of the total population is made up of mixed Indian and mestizo

groups who are at different stages of transculturation and who generally reside in rural areas. This population has been marginal in terms of income, means of production, and access to basic services such as health, education, housing, and social welfare. But above all, these communities historically have been left outside the political processes and the coverage of national development plans and programs.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

Health information suffers from major deficiencies that affect both the production and productivity of services and the morbidity and mortality data. Thus, while the infant mortality rate in 1987, according to the National Institute of Statistics and Censuses, was approximately 48 per 1,000 live births, the ENDESA–1987 study that same year found infant mortality at approximately 60 per 1,000 live births. Also, while the official overall mortality rate (1987) was 5.2 per 1,000 population, ENDESA–87 reported a rate of 7.6 per 1,000. There was a downward trend in the figures for overall mortality, infant mortality, and maternal mortality for 1978–1987.

The mortality structure reflects both the pathologies attributed to underdevelopment as well as those typical of development. Intestinal infectious diseases, respiratory infections, tuberculosis, and protein-calorie malnutrition are leading causes of death, along with motor vehicle traffic accidents, homicides, ischemic heart disease, and malignant neoplasms of the stomach (Table 2).

| Area | 1962 | 1974 | 1982 ^a | 1987 ^a |
|-------|------|------|-------------------|-------------------|
| Urban | 36.0 | 41.4 | 49.2 | 53.5 |
| Rural | 64.0 | 58.6 | 50.8 | 46.5 |

^aProjections.

Source: Population and Social Change. Sociodemographic Diagnosis in Ecuador, 1950–1982.

| Cause | Deaths | Rate |
|------------------------------------|--------|------|
| Intestinal infectious diseases | 3,812 | 38.4 |
| Pneumonia | 2,687 | 27.1 |
| Cerebrovascular disease | 2,414 | 24.3 |
| Bronchitis, emphysema, and asthma | 1,901 | 19.2 |
| Motor vehicle traffic accidents | 1,729 | 17.4 |
| Ischemic heart disease | 1,655 | 16.7 |
| Tuberculosis | 1,278 | 12.9 |
| Malignant neoplasm of stomach | 1,160 | 11.7 |
| Homicide | 1,002 | 10.1 |
| Other protein-calorie malnutrition | 953 | 9.6 |

The second leading cause of infant mortality—hypoxia, birth asphyxia, and other conditions of the fetus or newborns—is directly related to the institutional coverage of deliveries. Protein-calorie malnutrition, which is the seventh leading cause, is a contributing factor in most infant mortality; its high prevalence (49% of the population ages 0 to 5 years is affected) lowers the organic defenses of children exposed to environmental health problems (lack of drinking water, lack of excreta disposal, inadequate housing, etc.), who consequently risk death from pathologies that do not pose a major threat to better fed children. During 1982–1987, the ten leading causes of infant and overall mortality remained almost the same, although they changed in ranking.

Urban and rural areas show clear differences in the risk of death for children ages 0 to 1 year and 1 to 2 years (Table 3), with mortality in rural areas being higher up to 1986. In addition, infant mortality rises significantly when the mother is illiterate or has limited education and when there are many children in the family. In an analysis by regions and provinces, the highland region in 1987 had greater infant mortality (52.8 per 1,000 live births) than did the coastal region (42.5 per 1,000) or the eastern region (40.7 per 1,000); this is consistent with observations in some provinces where the Indian population constitutes a majority, where figures are much higher than the national average of 47.7 per 1,000 live births. The provinces of Esmeraldas (with a black population) and Los Ríos in the coastal region have the highest infant mortality figures, 60.2 per 1,000 live births and 64.4 per 1,000, respectively.

Health Situation of Specific Population Groups

Child Health

The decline in infant mortality over the last 20 years was due primarily to the reduction of postneonatal mortality (children 28 days old to 1 year old). However, in recent years the neonatal mortality component has increased as a percentage of overall infant mortality (from 35% in 1970 to 39% in 1986). The leading cause of neonatal death is hypoxia and birth asphyxia, which is tied to the limited institutional coverage of deliveries. The probability of death is nine times greater in children under 1 year old than in children 1 to 4 years old.

Most deaths from malnutrition occur in children between 6 months and 1 year old; anemia due to malnutrition is common in pregnant women, leading to low birthweight and to anemias in children under 1 year old. Diarrheal diseases and respiratory infections together cause 50% of infant mortality; these causes are associated

TABLE 3

Mortality in children under 1 year old and 1 to 2 years old, by urban and rural area, Ecuador, 1971–1976, 1977–1981, and 1982–1986.

| Years | 0 to 1 year old ^a | | 1 to 2 years old ^b | |
|------------------------|------------------------------|-------|-------------------------------|-------|
| | Urban | Rural | Urban | Rural |
| 1971–1976 | 77.5 | 115.3 | 93.7 | 136.0 |
| 1977–1981 | 51.5 | 90.8 | 57.1 | 109.7 |
| 1982–1986 ^c | 52.5 | 63.7 | 58.2 | 84.1 |

^aRate per 1,000 live births.

^bRate per 10,000 population that age.

^cIncludes January and February 1987.

Source: ENDESA–1988, Ecuador.

with children weakened by malnutrition or children whose immune systems have been compromised by malnutrition.

Mortality in children 1–4 years old also has diminished, from 44 per 1,000 population in 1972 to 25 per 1,000 in 1986 (ENDESA–87). This age group is affected by periodic measles epidemics (every three to four years) due to inadequate vaccination coverage. The probability of death in this age group also is significantly greater in rural areas than in urban areas (Table 4).

The leading causes of death in this age group are diarrhea, respiratory infections, measles, and accidents. The first two account for 47% of total mortality in the group, which suggests that many of these children are malnourished. Deaths from accidents show an erosion in the quality and quantity of attention and care within the family and the lack of services for children.

Nationwide, the caloric intake in children 1–5 years old is deficient, reaching only 71% of the required intake. In contrast, the protein content of the diet has been adequate (102% of the requirement), according to the “Dietary, nutritional, and health situation diagnosis of the

TABLE 4

Mortality in children 1 to 4 years old, per 10,000 population, by urban and rural area, Ecuador, 1971–1976, 1977–1981, and 1982–1986.

| Years | Urban | Rural |
|------------------------|-------|-------|
| 1971–1976 | 33.0 | 56.6 |
| 1977–1981 | 16.8 | 36.5 |
| 1982–1986 ^a | 11.2 | 38.0 |

^aIncludes January and February 1987.

Source: ENDESA–1988, Ecuador.

Ecuadorian population under 5 years old." Results from this study show that calcium intake is adequate for children aged from 12 to 23 months, but declines for older ages; iron is particularly deficient from 12 to 23 months and, although it increases slightly after that age, it does not reach satisfactory levels; riboflavin and thiamine intakes decrease with age. Only vitamin C consumption is higher than the recommended minimum levels. In summary, the inadequate quantity and quality of food intake, which prevails among major segments of the population, corroborated the findings of studies that estimate that more than 50% of the population is below acceptable survival limits.

Children 5 to 14 years old are the age group at least risk and show the lowest specific mortality levels. However, the difference between males and females is striking (mortality is higher in males). The coverage of Ministry of Health services for preschool and school-age children is low (10.4% of children enrolled in schools in 1987), and it has decreased in recent years (from 12.4% in 1979) due to the increase in the preschool and school-age population.

Health of Adolescents and Adults

The age group 15 to 19 years old is the least protected in terms of health. The leading causes of hospital discharges (INEC, 1986) in this age group were deliveries (28,628, at a rate of 12.7 per 1,000 population), traumas (6,889, at a rate of 3.9 per 1,000 population), and infectious and parasitic diseases (6,531, at a rate of 2.9 per 1,000 population).

Fertility in adolescents is high. In 1983 there were 329,000 births; of these, approximately 14% occurred in adolescents 15 to 19 years old.

The leading causes of death in this age group fall into three major categories: accidents and violence (including traffic accidents, homicides and injuries purposely inflicted by other persons, and suicides); infections (including those of the digestive system, respiratory infections, renal diseases, and pulmonary tuberculosis); and leukemia.

In 1967 the maternal death rate was 25.9 per 10,000 births. This rate declined to 14.9 per 10,000 births in 1984 (384 deaths), and then increased to 17.4 per 10,000 in 1987 (355 deaths). The frequency of pregnancies in adolescents, pregnancies too closely spaced, intense physical work, multiparity, and the high rate of induced abortions without medical care, are direct determinants of maternal morbidity and mortality. Of live births in 1987, 52.8% received professional care during delivery. In the urban area 76.3% received professional care, and in the rural area, 25.2%.

Ecuador's economically active population numbers ap-

proximately 2,900,000 persons. Occupational health problems arise from a combination of long-standing and known risks such as noise, solvents, pesticides, and industrial dusts and new risks from new technologies. High accident rates persist, especially in industries such as construction. There is a significant underregistration of occupational accidents because of employer sanctions, possible loss of employment, and especially the Government's insufficient registration and control of factories. The same is true of occupational diseases.

The morbidity and mortality profile of the adult population 25 to 44 years old has recently changed due to the increasingly important incidence of cardiovascular, metabolic, and oncological diseases, some of which rank among the ten leading causes of death. Motor vehicle traffic accidents and violence also are major causes of death.

Cardiovascular diseases increased most sharply from 1983 to 1987, especially hypertensive disease and cerebrovascular disease. The increase in mortality due to malignant neoplasms of the stomach and cervix in the 1970s was reflected in increases of 23.9% and 56.4% in the respective rates. During that period the country began a major process of industrialization and improved cancer detection services and the system of registration.

Health of the Elderly

Until 1984 there was no established policy for the protection and care of persons 65 years and older. Only a few nursing homes provided charity care for "abandoned elderly persons," especially those who suffered mental diseases. In 1984 the Ministry of Social Welfare created the National Bureau for Gerontological Care as a way to set up an organic structure to adequately address the problem. Now there are set policies, strategies, programming areas, and specific activities aimed at reintegrating the elderly population into society through specialized services.

Problems Affecting the General Population

In March 1987, a series of earthquakes with epicenters in the northeastern region of the country damaged buildings—including many of historical and cultural significance—and basic services, especially in the provinces of Pichincha and Imbabura. These earthquakes also caused large avalanches and floods that destroyed roads, bridges, and human settlements in rural areas of the province of Napo. In addition, the oil pipeline was damaged, decreasing oil exports and foreign exchange earnings. Nearly 75,000 rural and urban residents were directly affected, suffering serious consequences to their well-

being and a reduction of their incomes. It is estimated that some 1,000 people were killed and another 5,000 evacuated and relocated in temporary shelters; 3,000 dwellings were destroyed and 12,500 more needed repairs. Several hospitals, health centers, and primary and secondary schools also were damaged. In addition, the floods and avalanches eroded croplands and grazing lands and carried with them thousands of head of cattle, damaging crop and livestock production.

Malaria was under control until 1980. It experienced a significant increase in 1984, with 76,000 reported cases; by 1987, the number of reported cases dropped to 68,044. In 1988, there was a 15% decline from the previous year (53,607 cases confirmed through microscopic diagnosis). Nonetheless, there is still cause for concern because the disease's short-term control is limited due to administrative and technical conditions. In the Province of Esmeraldas, the principal site of transmission, there was a 42% reduction of total cases and a 22% decline of cases infected by *Plasmodium falciparum*. In contrast, in 12 of the country's 20 provinces, the number of cases increased in 1988. Control measures involved household spraying with DDT and presumptive and radical three-day treatments. The spraying in 1988 barely reached a rate of 20 per 1,000 inhabitants at risk, owing to the insufficient supply of DDT. The presumptive and radical treatments are administered primarily by Ministry health services in the malaria areas.

Although since 1974 *Aedes aegypti* control activities have been carried out in a population of approximately 2,500,000 persons living in 124 localities in seven provinces, in early 1988 there was an epidemic of dengue I in the city of Guayaquil; it subsequently spread to all of the city's urban parishes and to other smaller cities of the Pacific Coast, where nearly 3,000,000 persons live. The *Aedes* control and surveillance program continues, but personnel management problems and a lack of economic resources result in a household infestation index higher than 4% and in a Breteau index of 5% in some urban parishes of Guayaquil.

The high incidence of human and animal rabies is one of the country's most serious public health problems. From 1985 to 1987, several mass vaccination campaigns of dogs resulted in a decline of the death rates due to human and animal rabies. In 1987, four cases of human rabies were registered, while in 1983 there were 30 cases. However, since the number of cases of animal rabies in 1987 increased over those in the previous year, the mass canine vaccination campaigns will be continued.

Another problem affecting the population is the high incidence of taeniasis and cysticercosis, whose rates have skyrocketed—from 0.13 per 100,000 population in 1983 to 1.73 per 100,000 population in 1987 for cysticercosis, and from 0.86 per 100,000 in 1984 to 299.51 per 100,000 in 1987 for taeniasis.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

The structure of Ecuador's health services has evolved with the development of the country's social and political organization. There are three major subsystems: public, private (for-profit and nonprofit), and the popular (called the informal subsystem).

The public health subsystem is made up of the Ministry of Public Health; the Ecuadorian Social Security Institute (IESS), the Armed Forces Health Services, the Welfare Board of Guayaquil, the National Institute of the Child and the Family (INNFA), and the Ministry of Social Welfare (through the national network of day-care centers and the national program for comprehensive protection of the elderly). The most important of these agencies in terms of installed capacity, infrastructure, and coverage are the Ministry of Health and the IESS.

Theoretically, the Ministry of Public Health covers 70% of the population. Its health programs include all the components of comprehensive care, from health promotion to rehabilitation, as well as environmental health. From the political and technical standardization standpoints, the Ministry is responsible for establishing national policies, plans, and strategies and for designing, implementing, and evaluating technical standardization. In practice, these functions are limited to the Ministry's own infrastructure.

The Ecuadorian Social Security Institute covers public and private employees working in industry and commerce and, to a lesser extent, artisans, construction workers, and rural workers (the last through the Rural Social Security). The Institute's National Medical and Social Bureau was established as social security's medical department in 1936 as one of the accomplishments of the social struggles of the 1920s. Until March 1944, only member workers and private employees were beneficiaries of its services; since then, most public employees have been included, as have retirees since 1951. The "special affiliations" of recent years have not significantly increased the number of users. The Institute protects its members only in cases of disease, maternity, disability, old age, and death. Insufficient funds have prevented extending coverage to the beneficiaries' family members; the only coverage offered to family members is medical care (without medicines) to members' children up to 1 year old. The Institute's medical service does not cover the vast ranks of self-employed or independent workers.

Rural Social Security, which did not really begin until 1981, currently covers approximately 400,000 persons in rural areas (both affiliates and family members); this

is a significant increase, considering that there were only some 70,000 beneficiaries in 1977. The Institute's medical service and the Rural Social Security together cover approximately 13% of the population.

The Armed Forces Health Services currently has some 1,000 hospital beds. Its hospitals and outpatient services, which serve the civilian population on a small scale, cover approximately 2.5% of the population.

The Welfare Board of Guayaquil, a private nonprofit social institution, finances its health services mostly through the administration of its assets (buildings, a cemetery, and the lottery); the Government contributes 13% of its annual budget. The health services the Board provides are basically for health recovery and care in pregnancy, delivery, and the puerperium. It has four hospitals—one general and three specialty—all in the city of Guayaquil, with a total of 2,586 beds (15.7% of the national total). The bed distribution in the four facilities is as follows: general hospital, 814; obstetric-gynecology hospital, 332; psychiatric hospital, 1,214; and pediatric hospital, 226. Most of the users are from the city of Guayaquil, but also include patients from the coastal provinces and even more patients from the highlands.

Other private nonprofit entities are the Ecuadorian Red Cross, the Cancer Society, and several religious missions that operate many medical establishments of varying degrees of complexity in different regions of the country (from the most remote sites to the large cities).

The for-profit private subsector is made up of clinics, hospitals, and medical offices. This subsector is most organized and developed in the large urban centers. The Government's minimal control over these establishments is limited to the Ministry of Health's licensing of the establishment and operations of these facilities. There is no system for accrediting these hospitals or the professionals who work in them.

Outpatient services are the most traditional form of individual care and are provided by practically all of the country's 11,000 physicians, since, with few exceptions, these services do not conflict with employment in public institutions. There also are many cooperatives and private insurers that provide coverage for members' health risks; transnational companies provide health services for their personnel through agreements with hospitals or private physicians.

The informal health subsystem addresses the needs of rural and urban population groups whose principles and practices have evolved over time. This subsystem draws social support from networks with a high degree of participation; it attempts to affect the course and outcome of a given disease utilizing plant, animal, and mineral products that are used through various codes and symbols. The number of people who participate in this subsystem is unknown; according to some studies, in certain regions there is one healer for every 70 people, while in

other sites, which are ritual centers or training centers for healers, there are many more. It is estimated that this informal subsystem covers a large part of the population, especially in labor and delivery care.

The establishment of a process to link the different components of the sector within a national system primarily depends on the institutions' willingness to come together and work harmoniously. The National Health Council, established in 1980, could serve as a catalyst for the development of proposals to establish understanding, coordination, and complementation among these institutions. The Council's functions are to provide advisory services to the Ministry of Public Health on national health policies; to participate in the formulation, implementation, and evaluation of the health plan; and to prepare studies for adopting decisions on the organization and operation of the national health system.

The health policy aims at providing comprehensive care for everyone, with priority given to rural and marginal urban groups at greatest risk. Emphasis is placed on the development of models of care that integrate a control of the social factors at work in the health-disease process and that promote the participation of the social organizations in their own development. There also is an effort to develop local health systems that coordinate sectoral, extrasectoral, nongovernmental, and community resources and that can adapt to meet the population's most crucial needs.

Social participation in health has been very limited. The population has actively sought only to recover its health by requesting formal and informal care. However, due to their social, economic, and cultural status, vast segments of the population have only limited access to formal services.

The health sector, like the rest of the public sector, has been characterized by centralized decision-making and by the adoption of mechanisms that favor the centralized management of resources. This has led to red tape and an unwieldy bureaucracy and no opportunity for participation in decision-making. Despite the Ministry of Public Health's efforts to develop a process of regionalization and administrative decentralization that responds to national and local conditions, and to reform part of its organizational structure to make resources available, these attempts have not had significant results. Some provincial health bureaus, however, have initiated some administrative decentralization in support of the strategy of relying on local experience.

Production of Services

In 1987 the country's hospitals produced 29 discharges per bed; in 1971 the rate was 20 discharges per bed. This rate includes chronic-patient hospitals that have three ad-

missions annually. Of the public hospitals, those of the Ministry of Public Health had the highest productivity: 39 discharges per bed in 1987. The number of discharges has increased considerably, from 258,300 in 1971 to 471,440 in 1987, which translates into an increase in the rate of discharges from 41.4 per 1,000 population to 47.5 per 1,000. The 10% increase in discharges from 1984 to 1987 was due basically to the reduction in the length of stay (from 7.9 to 7.2 days), since the percentage of occupation declined from 60.4% to 56.7% in the period analyzed. There was a 5% increase in the number of beds. The Ministry of Health attended to 51% of hospital discharges in 1987, with an average stay of 5.8 days and 61.7% occupancy. The same year the IESS served 12% of hospital discharges, with an average stay of 8.6 days and an occupancy rate of 83.2%. The availability of beds varies from 3.5 per 1,000 population in the area of oil production to 0.7 beds per 1,000 inhabitants in the highlands.

In the Ministry of Public Health's emergency services there were 870,410 consultations in 1987, or 0.13 emergency consultations per inhabitant per year. The total number of prenatal consultations came to 370,980, and consultations during the puerperium numbered 64,630, or 4.1 consultations per delivery served and 0.7 postpartum consultations. However, outpatient services reported a considerably lower figure for prenatal consultations per delivery (2.5), which indicates that many pregnant women under control did not have access to institutional care for delivery.

In 1987, there were 5,411,620 total outpatient consultations, or 0.80 consultations per inhabitant per year. It is estimated that outpatient care services cover 65% of the total population. In the case of the Ministry of Public Health's outpatient services, the rate was 0.42 consultations per inhabitant per year; the rate of prenatal controls was 1.28; and that of controls in preschool and school-age children, 0.20 and 0.11, respectively (*vis-à-vis* their respective populations). This brings to light the low coverage of outpatient services. At the IESS services, the rate was 3.6 consultations per beneficiary. Data on consultations by private physicians are insufficient, and available information on care provided by the informal system also is inadequate.

Dental services are generally insufficient and inadequately equipped to provide preventive treatments and restorations. As a result, extractions are routinely performed.

Regarding coverage of and accessibility to health services, two groups can be clearly distinguished among the provinces. Those areas where utilization of formal health services is low and which consequently have limited coverage, have severely depressed economies, poverty, illiteracy, low levels of institutional care of deliveries, and

high infant, maternal, and general mortality, as well as a health services infrastructure with a limited capacity for resolving the population's health problems. The other group of provinces has high levels of utilization of the services and greater coverage (though not optimal in the marginal urban sectors); their health infrastructure is predominantly hospital-oriented, their death and birth rates are lower, they have a greater concentration of educational establishments, water and sewerage service coverage is reasonably good, and private medicine is fairly well-developed. The latter provinces have experienced industrial and agricultural development; they constitute migration magnets and they have begun to show signs of family breakup.

A model for the organization of local health services currently is being developed based on a definition of the geographical area and population under the responsibility of each health unit; on the allocation of decentralized functions and resources in an effort to attain maximum self-reliance; on the establishment of a local network of services with clearly identified management levels; and on the links within a referral and mutual support system. To this end, each health unit is encouraged to take stock of and analyze its local situation in order to determine the coverage, impact, and complexity of the services needed to meet the population's needs.

Installed Capacity

In 1987, the country had 2,260 health establishments, of which 380 were hospitals and 1,880 outpatient services, distributed among 66 urban health centers, 289 health posts, 789 health subcenters in the rural area, and 736 urban and rural dispensaries; 514 belonged to the public subsector. The number of available hospital beds was 16,426. Of these, 7,697 (46.8%) belonged to the Ministry of Public Health; 1,607 (9.8%) to the Ecuadorian Social Security Institute; and 926 (5.6%) to the Armed Forces Health Services. Of the total beds, 65% correspond to the public subsector. There are 13,666 beds for acute care and 2,760 for chronic care; the Ministry of Public Health has 6,286 (46%) of the acute beds and 1,488 (54%) of chronic beds.

From 1981 to 1984, bed availability declined from 2 to 1.7 per 1,000 population; this ratio held from 1984 to 1987. The provinces of Pichincha, Guayas, and Azuay, have 48% of the population and 65% of the beds. Bed availability by regions is relatively even: 1.7 for the highlands, 1.6 for the coast, and 1.9 for Amazonia. However, within each region, hospital beds are concentrated in the most developed cities and provinces.

Most outpatient facilities come under the Ministry of Public Health's network of health centers, urban and rural

health subcenters, and rural health posts. In addition, there are emergency and outpatient services at the hospitals. The IESS has 49 dispensaries that provide outpatient care for the insured population and emergency rooms and outpatient departments at its 16 hospitals. Rural Social Security provides outpatient services to the rural population through 312 dispensaries. An estimated 2,000 private medical offices provide outpatient care.

Health Services Technologies

The country has a private industrial capability that enables it to cover most of its drug needs, but it imports almost all the raw materials required for their manufacture. There is adequate capability to produce BCG, DPT, TT, and DT vaccines. The needs for human rabies vaccine are covered at the basic levels. No other rabies vaccines are produced for human use. Quality control is under the responsibility of the National Institute of Hygiene, which comes under the Ministry of Public Health. Control of samples also is conducted for drugs that are procured for social programs.

In 1985, some programs for drugs were reactivated and the program to distribute free medicine to children under 5 years old (Megrame 5) was established. It was then expanded to Megrame 8, and now to Megrame 15. Most generic drugs included in the basic table for the above-mentioned programs could be provided by the national pharmaceutical industry.

From October 1987 to September 1988, the purchases of the Ministry of Public Health, the IESS, and other nonprofit institutions accounted for just 17% of the national pharmaceutical industry's total sales volume.

Most of the elements used for providing medical services are not produced in the country. In addition, there is a lack of price controls (which do exist, in one way or another, for drugs). The accelerated devaluation of the currency has caused imbalances in the health units' operating budgets, to the detriment of the quality and effectiveness of services. This is why the National Drug Center is studying the possibility of directly importing inputs for public institution needs.

All public subsector hospitals have diagnostic laboratories; their level of sophistication is tied to the level of care offered in the hospital. In addition, the country has a network of laboratories located in the provincial capitals, which combine water and food quality-control measures with care for the population through diagnostic tests for the most prevalent communicable diseases in each area. The main laboratory, located in Guayaquil, also carries out quality control of drugs and biologicals for human and animal use. In the four eastern provinces these laboratories have been linked to Ministry of Health hospitals.

Almost all the radiology services installed in the Ministry's canton hospitals are out of service, basically because of lack of maintenance. In addition, there is not enough trained personnel to operate this equipment. In the provincial hospitals the situation is somewhat better; however, there is a lack of x-ray plates and other materials. The CAT scanner at the Eugenio Mirra Hospital of Quito has been out of service for almost two years. The x-ray services of the IESS are in better condition and are better maintained. The IESS has one CAT scanner in Quito and one in Guayaquil.

The Ecuadorian Red Cross is responsible for administering the country's network of blood banks. There are blood banks in the provincial capitals. The more complex hospitals of the Ministry of Health, the IESS, and the Armed Forces Health Services have blood banks that are operated in conjunction with and under the technical supervision of the Red Cross. Tests to detect HIV and serum hepatitis are carried out routinely on blood for transfusions.

Financing of the Health Services

There is no reliable information on the structure of national health expenditures, since in addition to the official and semiautonomous institutions whose basic objective is to provide health care, there are many other institutions that carry out health programs and whose expenditures at the national level are unknown. Also, many different projects in other sectors include a health component, and their expenditures are unknown. Finally, many "relief" contributions allocated directly to provinces and localities by Congress do not show up in the health budgets.

The overall national budget increased from 45.30 billion sucres in 1980 to 362.88 billion in 1987, for a percentage increase of 701% (in current sucres). The health allocation was 2.29 billion sucres in 1980 and 24.25 billion in 1987, which in current sucres represented an increase of 959%. However, the adjustment in constant 1975 sucres for the total population shows that the general national budget experienced a real increase of barely 17% in the period, since the economic crisis that began in the 1980s required major readjustments. In contrast, the health budget increased 56%.

This increase was affected by inflation and by population growth. After an initial increase in the national and the health budgets as a result of a per capita deflation (from 3,092 and 156 sucres per inhabitant in 1980 to 3,501 and 269 in 1981, respectively), there was a steady decrease in subsequent years, with the greatest decrease in 1984 (2,653 and 200 sucres per inhabitant, respectively). Increases resumed in 1985.

The analysis of financing sources only includes the three

major institutions that make up the sector and for which information is available: the Ministry of Public Health, the IESS, and the Welfare Board of Guayaquil. The Ministry's budget is mainly financed by allocations from the national budget.

The steady decline in the financing of benefits provided by the Ecuadorian Social Security Institute, expressed in constant values, mainly has been due to inflation, since the protected population has increased only slightly. The institutional investments and credits that the IESS grants to its beneficiaries, which initially were established as an ancillary and incidental mechanism, are now so important that the institution has become a financial entity. This crisis derives not only from factors within the IESS, but also from its limited financial capability and potential. Since the Institute's medical insurance system is of a simple disbursement type, its annual income should cover all of its expenditures. In practice, however, the proportion of quota payments that the law earmarks to this end does not even cover operating expenses, let alone investments; consequently, the General Insurance has had to be tapped as a source of financing, thus accelerating decapitalization. This situation will be aggravated in the medium-term as new hospitals open and begin operating.

In 1987, operational health expenditures absorbed approximately 82% of the budget; nearly 35% of current expenditures are used for the delivery of services at the provincial level, 7% to subsidize the program for drugs and the decentralized Institutes (mainly the National Service for the Eradication of Malaria and the National Institute of Hygiene), and 24% for activities administered directly from the central level. Approximately 80% of regular expenditures go to salaries. The percentage of the health sector budget earmarked for investment in health establishments and water supply and excreta disposal systems increased significantly in 1986–1987, especially for investments and construction financed by the Sanitation Fund (FONASA) and for completing the construction and equipping of hospitals. The policy of external financing and debt renegotiation are being reviewed jointly.

Health Planning and Administration

The National Development Council (CONADE) is responsible for establishing general guidelines and for coordinating the preparation and consolidation of the institutional plans and programs. In practice, this responsibility has been limited to collecting and organizing institutional plans submitted to the President of the Republic for approval. Each health institution plans according to its objectives and interests, frequently leading to incompatible or duplicated plans and programs which

are often plagued by technical inconsistencies. The community does not participate in this planning process.

In general, health planning has been oriented toward standardization, and has yet to become an integral unit of the system of services. The structure of the health institutions' planning offices and the availability of their personnel generally do not reflect the importance of the responsibilities and functions of said agencies. Moreover, the feedback that makes it possible to improve planning has been limited to a reformulation of the quantitative goals.

The Health Information System is limited to the collection and statistical processing of morbidity data (diagnosis of hospital discharges), vital statistics, and the output of the institutional health units (number of outpatient consultations) that come under the Ministry and the IESS. Responsibility for the collection and processing of this information is shared by the INEC and the Ministry of Public Health. The official publication of vital statistics and hospital morbidity is somewhat delayed. Many factors contribute to the questionable reliability of this late information, including the limitations or lack of data analysis. These characteristics limit the information's use for planning and administration, and constitute an aspect that needs critical development in the health system.

Human Resources

The training of professionals, especially physicians, emphasizes biological aspects and mostly prepares graduates for private practice. Recently, some training institutions have begun to introduce public health curricula that emphasize intercultural relationships between those in charge of providing health care and the user population. The School of Medicine of the Central University (Quito) has a graduate course in public health with an emphasis on research.

There is an ample supply of physicians and an insufficient supply of nurses and nurse auxiliaries (one nurse for every four physicians; one auxiliary per physician). The ratio of physicians per 1,000 population is slightly better than that of other countries in the same income group. The ratio of dentists, on the other hand, is too low; its stagnation is critical in the face of the growing oral health problems (Table 5). The dramatic increase in the number of physicians in the last decade was due to unrestricted entry into medical schools and the establishment of new medical schools (at present there are six). Because of a lack of infrastructure or budgetary resources, the principal agencies responsible for the delivery of public health services—the Ministry of Public Health and the IESS—cannot absorb this increase, and the new physi-

TABLE 5

Ratio of health personnel by type, per 10,000 population, Ecuador, 1983 and 1987.

| Type of personnel | 1983 | 1987 |
|-------------------|------|------|
| Physicians | 8.8 | 10.0 |
| Dentists | 1.3 | 1.3 |
| Nurses | 2.0 | 2.8 |
| Obstetricians | 0.3 | 0.4 |
| Nurse auxiliaries | 11.5 | 12.2 |

Source: INEC, Annual Survey of Health Resources and Activities (1972–1983), 1987. INEC 1982–1995 population projection: 9.9 million inhabitants.

icians cannot work in the private sector due to a lack of clientele. As a result, there is an overabundance of physicians, especially in the cities; moreover, the health services have developed approaches to care based on medical personnel.

Human resources for health—both those that work in the different institutions and those in private practice—are concentrated in the urban areas, to the detriment of coverage in the rural areas. In addition, 85% of the physicians are concentrated in the provinces of Pichincha, Guayas, and Azuay, reflecting the above-average socioeconomic development in these areas. In 1981, the Ministry of Public Health established the Institute of Training, which is responsible for planning, coordinating, and supervising all training and continuing education activities, including the supplementary training of physicians, dentists, and registered nurses providing their rural service. However, budgetary restrictions have limited the Institute's activities and its expected impact. The IESS and the Welfare Board of Guayaquil also carry out programs for permanent training in and teaching of nursing. The training of community health promoters was initiated many years ago; however, the Ministry of Public Health currently has only 330 promoters nationwide. Religious missions also have trained health promoters; an estimated 200 new health promoters are employed by nongovernmental organizations.

HEALTH AND THE ENVIRONMENT

As the International Drinking Water Supply and Sanitation Decade draws to a close, it will be impossible to meet the proposed goals, given that in 1987 coverage reached only 80% of the urban population and 37% of the rural population with water supply through house connections or within easy access, and 77% of the urban population and 34% of the rural with sewerage or with some sanitary system for excreta disposal.

Despite the fact that the volume of services increased, these figures, as compared to the previous five-year period, show a reduction in the coverage due to population growth. Considering that the provision of drinking water and basic sanitation are priorities for achieving improved health levels, the 1988–1992 National Health Plan contemplates activities aimed at correcting this situation.

Regarding the collection and disposal of solid wastes, it is estimated that 60% of the population living in the major cities has services for household collection of refuse. Street sweeping is done only in the center of the cities and benefits 40% of the urban population. The total volume of refuse generated in the country is unknown, but it is estimated at 0.6 kg per inhabitant per day; most of it is organic waste. The basic problem is final disposal, which in most cases is done in open cut spillways, and causes sanitary problems such as the proliferation of insects and rodents. A national program has been launched to convert the open cut spillways into sanitary landfills.

In the main cities, air quality stations (REDPAN-AIRE) measure settled particulates, suspended particulates, and sulfur dioxide; eventually, they also will measure lead. At times, settled and suspended particulate levels have surpassed allowable limits.

Sewerage system discharges and untreated industrial waste have worsened the water pollution in most watersheds. There are signs of eutrophication in several lakes due to industrial discharges.

Studies have been initiated on noise pollution in Quito, Guayaquil, Cuenca, and Machala; the levels registered indicate the need for noise control, mainly in the center of those cities, in the industrial complexes, and in the vicinity of the airports.

EL SALVADOR

GENERAL CONTEXT

Political, Economic, and Social Situation

El Salvador's particularly difficult social situation is affected not only by the economic crisis, but also by the eight-year-long internal war which has repeatedly caused social and political upheavals. In the late 1970s, social and political violence increased and subsequently evolved into the social, political, and military conflict that now ravages the country. The conflict is rooted in social injustice, and is characterized by the lack of educational and employment opportunities and by the social and economic privation of the most dispossessed classes.

Despite the violence and civil war, democratic processes and institutions are being consolidated in the country. The Constitutional Assembly, elected through an overwhelming popular vote in 1983, drafted a new Constitution. In 1984, municipal governments, the Congress, and the President of the Republic were elected. In 1988, new elections were held for members of Congress (Legislative Assembly), and in 1989 presidential elections were held.

In 1982, the banking system and foreign trade were nationalized. Also, the first stage of the agrarian reform was implemented, distributing properties larger than 500 hectares to rural inhabitants (before this, 70% of the arable land was concentrated in the hands of 15% of the population). In 1984, a national plan called "Road to Peace" was established to consolidate structural reforms and to promote community participation in local development as a way to achieve national development.

In 1984, the colón was officially devalued 100% (from 2.5 to 5.0 per \$US1.0). The gross domestic product (GDP) rose 128.7%, at constant 1962 prices, from 1962 to 1978. Beginning in 1978, as violence worsened, the GDP decreased, with a reduction of 22.3% from 1978 to 1982; from 1982 to 1988, the GDP increased 9.1%. Per capita GDP, also in constant 1962 prices, increased 43.1% from 1962 to 1978; then it declined (Table 1).

If the total GDP increase does not surpass the natural population increase, per capita GDP will continue to fall.

El Salvador has been affected by the global inflationary trend. Annual inflation was 11.7% in 1984, 22.4% in 1985, 31.9% in 1986, 24.9% in 1987, and 19.8% in

| Year | Per capita GDP |
|------|----------------|
| 1962 | 586.7 |
| 1965 | 640.6 |
| 1970 | 667.0 |
| 1975 | 764.4 |
| 1978 | 839.3 |
| 1982 | 615.7 |
| 1983 | 615.6 |
| 1984 | 623.7 |
| 1985 | 627.9 |
| 1986 | 621.7 |
| 1987 | 626.8 |
| 1988 | 617.6 |

Source: Economic and Social Program for 1989. Ministry of Economic and Social Development Planning and Coordination, January 1989.

1988. From 1984 to 1988, there was a significant growth of GDP at current prices, but this growth was virtually offset by inflation.

Except for a reduction in 1985, the balance of payments deficit increased 37.5% from 1984 to 1988; according to the Central Reserve Bank, it will continue to grow in 1989.

From 1979 to 1985, the external debt grew at an average annual rate of 14.1%, and then declined from 1986 to 1987 to an average annual rate of 3.0%. The maximum level reached was \$US2 billion in 1985; by the end of 1988, the total was \$US1.91 billion. This reduction was due mostly to payments made by the Central Reserve Bank (\$US211.1 million) and, to a lesser extent, to the amortizations of the private sector and the commercial banks. The ratio of external debt to GDP increased from 1979 (27.3%) to 1986 (48.8%). By the end of 1987 it had fallen to 40.3%. The external debt service absorbed 48.1% of exports in 1986 and 45.5% in 1987.

The minimum wage varies for industry, commerce, and agriculture. Within these categories, the minimum wage in San Salvador is higher than that in other cities of

second or third order of importance. It also is higher for men than for women, which means that in many jobs related to coffee and cotton cultivation, as well as in other agricultural tasks, men are denied employment opportunities. The lowest daily minimum wage, which is for women working in agriculture, was \$US0.92 in 1984 and \$US1.80 in 1988. The highest minimum wage is for industry within the municipal jurisdiction of San Salvador: in 1984 it came to \$US2.60 and increased to \$US3.60 in 1988. These wage levels do not reflect the economic situation of most of the population. The nationwide Household and Multiple Purpose Survey carried out by the Ministry of Planning in 1985, showed that the first eight deciles of the sample had very low income, and that only the ninth decile of families included in the sample had an average income of \$US122 per month or more (the highest income for this group was \$US150 monthly).

From 1978 to 1988, the basic family basket—made up of 158 articles including food, clothing, and housing services—increased in cost 100% to 528%, according to the price index calculated by the General Bureau of Statistics and Censuses. The Ministry of Economic and Social Development Planning updated the prices of the basic food basket in 1988. For an average family living in the rural area, the daily cost was estimated at \$US2.36, which is equivalent to 131% of the rural minimum wage. For an average family living in the urban area, the daily cost of the basic family basket is \$US4.52, equivalent to 126% of the highest urban minimum wage. This reveals the limited capacity to offset the effects of inflation and the economic adjustment program for the low-income population. The supply of basic foodstuffs for human consumption, such as corn, beans, meat, eggs, milk, fats, and vegetables, traditionally has not been deficient in the country. These products represent 85% of the recommended basic food basket.

In 1980, 30.2% of the population 10 years old and older was illiterate; in 1985 illiteracy affected 26.2% of the population 9 years old and older. Illiteracy is not evenly distributed: in the rural areas it reaches 36.2%, while in urban areas it is 15.3%. From 1983 to 1987, there were 334,200 enrolled students, owing to an increase in primary education (from 72.4% to 80.3%) and higher education (from 13.4% to 17.6%) coverage.

Demographic Characteristics

The country's population is characterized by an accelerated growth caused by a high birth rate and a decreasing death rate. No census has been carried out since 1971, which means that the population figures are based on estimates. The population of El Salvador is eminently

young: nearly 50% is under 15 years of age, while those under 20 years old account for almost 60% of the total population. There is underregistration of emigration, which has risen due to the armed conflict and the economic crisis. The seasonal internal migration as a result of coffee, cotton, and sugarcane harvests has increased substantially due to the conflict affecting the country. Conservative estimates indicate that the conflict has resulted in some 500,000 internally displaced persons during the last three years. Since late 1987, large groups have settled in sites near their places of origin and live in very precarious conditions.

The earthquake of October 1986 increased the poverty settlements surrounding San Salvador. As a result, plans to improve the infrastructure in many of these areas were implemented in 1987; in addition, urban development plans were implemented in areas near the capital. Although the birth rate shows a downward trend, the population continues to increase.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

The overall death rate and specific death rates are very much affected by the armed conflict, which has resulted in many violent deaths, especially in males and in young age groups. However, there is a downward trend in the overall death rate, which has dropped from 10.8 per 1,000 population in 1980–1985 to 6.4 per 1,000 in 1985–1988. According to the Latin American Center of Demography (CELADE), underregistration in the country is as follows: 10.7% for the census, 6.5% to 13.5% for birth registration, and 24.6% to 33.6% for death registration.

The greatest change observed in the ten leading causes of death was in violent acts (homicides and intentionally inflicted injuries), which have been among the five leading causes of death since 1978 (Table 2). Before that date, they occupied seventh and eighth place. The greatest mortality from this cause occurs among the economically active population.

Infant mortality shows a downward trend. Estimates by the population department of the Ministry of Economic and Social Development Planning indicate that this rate has varied from 118.0 per 1,000 live births in 1970–1975 to 57.4 in 1985–1990. This rate is 20% higher than that reported by the Ministry of Public Health and Social Welfare (43.8 per 1,000 live births from 1980 to 1984). Of deaths in children under 1 year old, 60% are due to infectious and parasitic diseases,

| Order | Cause | Deaths | % ^a | % with medical certification |
|-------|--|--------|----------------|------------------------------|
| | Deaths from all causes | 33,284 | 100.0 | 47.0 |
| | Ill-defined symptoms and conditions | 7,178 | 21.6 | 7.2 |
| | Total from defined causes | 26,106 | 100.0 | |
| 1 | Other diseases and ill-defined diseases originating in the perinatal period | 2,898 | 11.1 | 32.2 |
| 2 | Intestinal infectious diseases due to other specified organisms and ill-defined intestinal infectious diseases | 2,645 | 10.1 | 19.2 |
| 3 | Homicides and intentionally inflicted injuries | 2,576 | 9.9 | 90.7 |
| 4 | Other accidental causes | 1,695 | 6.5 | 69.1 |
| 5 | Malignant neoplasms in all locations (including leukemia) | 998 | 3.8 | 68.7 |
| 6 | Cerebrovascular disease | 905 | 3.5 | 50.7 |
| 7 | Ischemic heart disease | 887 | 3.4 | 37.5 |
| 8 | Bronchitis, emphysema, and asthma | 852 | 3.3 | 18.3 |
| 9 | Diseases of pulmonary circulation and other forms of heart disease | 761 | 2.9 | 51.1 |
| 10 | Motor vehicle accidents | 677 | 2.6 | 97.8 |
| | Subtotal, causes 1 to 10 | 14,894 | 57.1 | 51.6 |
| | Other causes | 11,212 | 42.9 | 67.7 |

Note: Deaths of persons residing abroad are excluded.

^aThe percentage by cause is based on the total deaths due to defined causes.

Source: General Bureau of Statistics and Census.

especially diarrhea; 4% to 8% of such deaths are from diseases preventable by vaccination.

Health Situation of Specific Population Groups

Child Health

More than 60% of infant morbidity and mortality is related to infectious diseases. From 1985 to 1989 no important changes occurred: parasitoses, influenza, diarrheal diseases, and amoebic dysentery continue to be the leading causes, with rates that range from 3,095.7 per 100,000 population for parasitoses to 237.7 per 100,000 for amoebic dysentery. Diseases preventable by vaccination are no longer among the five leading causes of morbidity.

Many national and international nongovernmental organizations provide maternal and child health services in El Salvador, especially in communities affected by the armed conflict. However, many rural communities do not benefit from these activities. The Program for Child Care, a priority for the public sector, includes activities for monitoring healthy children, nutrition, promotion of breast-feeding, immunization, control of diarrheal diseases, and others.

Four three-day national vaccination campaigns have been carried out. In 1988, 83% of children aged 1–5 years old were vaccinated against measles, and 68% received poliomyelitis and DPT vaccines. In 1989, measles outbreaks occurred in the age group 6 to 15 years old. The vaccination campaigns also control vitamin A deficiency by administering vitamins.

Some indicators in the rural areas are twice the national

averages. The death rate of children under 1 year old was 57.4 per 1,000 in the countryside, as compared to a national rate of 43.8 (1980–1984). More than one-third of infant deaths occur during the child's first month, and they are largely attributed to low birthweight. According to available information, 9% of newborns in institutional deliveries had low birthweight in 1984. Studies done at the University of El Salvador place the figure at 15%, of which 10% corresponds to the rural areas and 5% to urban areas.

Mortality in children 1–4 years old is 27 per 1,000 children; diarrhea and respiratory infections are the leading causes of death. Up to 40% of children under 5 years old have suffered from diarrhea in the last month; only 14% receive oral rehydration.

Malnutrition has increased in the last decade, affecting 50% of all children 6–11 months old. Nearly 40% of children are breastfed for less than six months; only 10% continue to receive breast milk after 18 months of age.

There are 647 children under 5 years of age per pediatric bed in the country. Of consultations for growth and development, 70% are attended to by nurses and 20% by physicians. The remainder are attended to by other personnel. There are 2.3 consultations for growth and development per child under 1 year old. The care provided children 1 to 4 years old by the Program for Child Care accounts for 13% to 17% of the total care provided at the regional level and nationwide; approximately 85% of that activity is concentrated in children under the age of 1 year.

Nationwide, 53% of children under 5 years old had morbidity consultations; there are considerable differences among regions. Only 2.42% of children under 5 years old who have moderate or serious malnutrition participate in the Program. Although this yields a figure of six consultations for each child under 1 year old registered in the Program, there only were approximately four consultations per user.

Health of Adolescents and Adults

The Ministry of Public Health does not have programs specifically directed to adults. Care is offered according to demand for consultations and hospitalization. Data from the Salvadoran Social Security Institute (ISSS) show that 7% of the total population of El Salvador is covered, although 34% of the population contributes to the Institute. Those who work in manufacturing are the largest contributing occupational group.

The ten leading causes of death in El Salvador include diseases and conditions that are much more frequent in adults, among them homicides and intentionally inflicted injuries; accidents (including motor vehicle accidents); malignant neoplasms; bronchitis, emphysema, and

asthma; cerebrovascular disease; ischemic heart disease; and diseases of pulmonary circulation.

The average number of children per woman of reproductive age continues to be high (four children). Only 47% of these women utilize some method of family planning.

The breakup of the maternal and child health program into several vertically managed projects with different financing sources has led to the irrational and inefficient use of available resources and has split the care for the mother-child pair in order to conform to the objectives of specific projects. Moreover, this situation produced ineffective care at a high social cost. As a result, an integrated maternal and child health program was formulated as a basic line of action in the Ministry of Health. Its technical, programming, and administrative standards make it possible to determine the level of complexity for each activity according to the level of care and the degree of responsibility of the local team and each of its members in the activity's implementation.

Of the total births registered in the country, 34% were institutional deliveries, and this figure varied according to region from 18% to 62%. The percentage of deliveries by cesarean section in Ministry of Public Health institutions ranges from 9% to 19%, depending on the region. The percentage of preventive care and referrals provided by community health workers is approximately 8%; their efforts focus on curative care, which represents more than 50% of their work.

Problems Affecting the General Population

The impact of the economic recession has been aggravated by both natural disasters (floods, earthquakes, droughts) and man-made disasters (war and violence). During eight years of open warfare and several more years of preparation for insurrection in the 1970s, the population has lived through periods of anxiety and violence that have had an effect on mental health, as shown in the reasons for consultations. The aggressiveness of the war and the ensuing degree of anxiety that the population suffers, has made disability a major health problem. Even though there are no official data in this respect, the number of persons who have been disabled directly or indirectly by the war has been on the rise; the young are especially affected. No institution or program appears to be capable of efficiently serving the group of persons with physical or mental disabilities.

The displaced population, half a million persons, has crude death rates three times greater than the nondisplaced population (21 per 1,000 as compared to 6.9 per 1,000). The percentage of deaths in children under 5 years old is also greater for the displaced group (28.3%

as compared to 26.8%). This population also suffers greatly from malnutrition. A 1985 survey of the displaced population showed that of a total of 6,419 children under 5 years of age, 28.8% had normal weight for age, 43.1% suffered from first degree malnutrition, and 28.1% had second and third degree malnutrition.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

El Salvador's Constitution confers upon the Ministry of Public Health and Social Welfare responsibility for the health of all inhabitants. Other institutions that offer health services do so with limited coordination of activities. The Ministry's constitutional responsibility covers the prevention, protection, and improvement of health, including environmental health.

All public employees, their spouses, and their children under 7 years old are covered by the social security system; the Ministry of Public Health is responsible for the curative care of the rural population, private sector employees and workers who are not covered by the ISSS, and the population under 15 years old. For administrative purposes, it has been established that the Ministry is responsible for covering 85% of the country's population. Emphasis has been placed on the need to supplement not only the activities of the Ministry, but also those of the 70 institutions that deal with health in the country.

Intrasectoral and intersectoral coordination is considered a health policy priority. Contact points and consensus areas have been identified within the conceptual and strategic bases that underlie all or most of the health programs. The principles of primary health care constitute a strategy for attaining an improved level of health.

One of the greatest challenges facing the country's health system is the implementation of measures aimed at consolidating the processes of local programming and at structuring integrated local health systems. The Master Plan for Institutional Development has been particularly important in helping the public health sector become better organized and more aligned with established objectives.

The operational consolidation of interinstitutional and intrainstitutional programs is another priority, since in addition to providing health care to the already large population at risk that existed prior to the armed conflict, displaced persons, refugees, and repatriates living in camps now need to be covered. Countless national and

international efforts have been undertaken to cope with this emergency.

The ISSS began by providing coverage for disease, maternity, and occupational hazards for private sector workers. In 1969, coverage for disability, old age, and death was added. In 1977, the Institute began to cover public employees against deferred risks through the National Institute of Public Employee Pensions. In 1979, public employees began to be included in the ISSS; they were completely incorporated in 1989. Disease, maternity, and occupational hazards coverage includes all curative aspects of those insured; prenatal and delivery care for the insured and beneficiaries; preventive care for children of the insured who are under 2 years of age; and prevention related to occupational hygiene and safety. The economically active population is estimated at 33.5% of the total population; social security covered 13.7% of this population in 1976 and 12.9% in 1986.

The ISSS obtains services from the Ministry of Public Health for providing care to the insured in 19 hospitals. The proportion of the insured who lived in the metropolitan area was 64.4% in 1976, 67.9% in 1981, and 69.5% in 1986.

The ISSS covers all employees and workers in commerce, industry, private banks, and small independent businesses in the capital and large cities. Since 1989, it has provided coverage to all public and domestic employees for disease, maternity, and occupational hazards. Agricultural workers, small businesses located in the small cities of the interior, workers in agroindustry, and temporary workers are not covered by the ISSS.

Given the substantial increase in the ranks of the Armed Forces as a result of the armed conflict and the particular risks that enlisted men face, the Armed Forces Preventive Health Institute was created. The Armed Forces and the security forces have access to the Military Hospital located in the capital. The internal war led to the establishment of a new hospital in San Miguel; the infrastructure and technology of the existing hospital were improved. The Military Health unit provides curative care and rehabilitation services to all members of the Armed Forces, the security forces, and the paramilitary corps, as well as to their immediate dependents (father, mother, spouse, and children)—150,000 persons in all.

Other governmental and private organizations offer curative care to their members. These include the National Telecommunications Administration, a government agency with a hospital located in San Salvador and clinics in more than 30 cities of the interior. The Ministry of Education has an agency called Teacher Welfare, which offers curative services to Ministry staff (teachers and technical and administrative employees) through contracts with private physicians and hospitals.

Some unions and professional associations, including

the General Association of Public and Municipal Employees, offer curative services for their members with limited coverage.

El Salvador has traditional midwives and healers who offer services in exchange for cash or in-kind compensation. This sector is being incorporated into the Ministry of Health. Midwives are offered some elementary training and supplies free of charge, and they are requested to provide information about the patients they serve.

Activities are under way to bring about administrative decentralization and deconcentration. Regional Administrative Management units have been created in the country's five health regions. Each unit has a finance and bookkeeping department, a supplies department, a personnel department, and a general services department. Financial codes, laws, and regulations that hinder the decentralization of certain administrative procedures currently are being amended.

With the help of the communities, the health establishments nationwide have determined their geographical areas of coverage. They have also established coordination with the communities so as to carry out the first stages of local programming; coordination with other governmental institutions is still limited.

Financing of the Health Services

Government funds are the main source of financing for the governmental institutions that provide health services. The ISSS financing is broken down as follows: workers contribute 25%; employers, another 25%; and the Government, the remaining 50%.

For several years the Ministry of Public Health has received grants from the Government of the United States of America through the Agency for International Development (USAID). In 1974, it began to receive grants from the United Nations Population Fund (UNFPA); at different times grants have been received from the United Nations Development Program (UNDP), the United Nations Children's Fund (UNICEF), the World Food Program (WFP), and the Inter-American Development Bank (IDB).

After the 1986 earthquake, the European Economic Community (EEC) and the governments of Canada, the Federal Republic of Germany, France, Italy, Japan, the Netherlands, Spain, the United Kingdom and several Latin American countries offered grants and loans totaling \$US2 million in 1986 and more than \$US12 million in 1987. Contributions have been earmarked primarily for reconstruction and repair of earthquake damages.

The national budget increased from 2.30 billion colóns (\$US459.7 million) in 1984 to 3.50 billion colóns (\$US701.2 million) in 1988, an increase of 52.5%. The

budget of the Ministry of Public Health and Social Welfare has accounted for 7.1% to 8.7% of the national budget. The lowest amount, 186.9 million colóns (\$US37.4 million), was in 1986, when it had decreased 6.7% from 1984. In 1988 it rose to 289.0 million colóns (\$US57.8 million), an increase of 54.6% as compared to 1986, and 44.3% as compared to 1984. The per capita sum allocated to the Ministry was 42.54 colóns in 1984, 38.57 in 1986, 58.19 in 1987, and 57.44 in 1988. From 1984 to 1986, the total Ministry budget declined, mainly at the expense of expenditures for investment.

ISSS revenues depend on the number of contributing insured persons. This number was 225,489 in 1979, 182,115 in 1981, and 208,595 in 1986. Similarly, ISSS revenues increased until 1978, when they reached 112,553,839; in 1986 the figure stood at 157,919,416. The largest contribution (45.7% to 66.9%) has been made by employers.

The largest disbursements of the ISSS, which correspond to medical benefits, have ranged from 52.2% to 71.9%. The largest share of ISSS expenditures corresponds to direct services provided to the insured, and ranges from 70.2% and 92.1% of total expenditures.

Human Resources

In December 1988, there were 3,253 physicians registered with the Board of Surveillance of the Medical Profession. Reliable data concerning the number of physicians who work without being registered with this board are not available. Most physicians work in San Salvador or in the other main cities. Hence, the physician-per-inhabitant ratio varies from 1 per 5,000 to 1 per 50,000, depending on the area of the country. In general, the combat areas have the least coverage.

The Ministry of Public Health and the ISSS are the two institutions with the most health-related human resources. In 1988, the Ministry had 2,017 physicians and 183 dentists, while the ISSS contracted 1,050 physicians and 107 dentists. Other institutions that hire available human resources are the Armed Forces (with two hospitals), Teachers' Welfare, the Telecommunications Workers Hospital, the Agrarian Reform Cooperatives, and another 75 public and private sector institutions that have health programs.

El Salvador provides human resources training at the university level, in secondary schools, and in nonuniversity schools of higher education. Beginning in 1981, the number of private universities has increased significantly: seven train physicians, nurses, dentists, and other health-related technical personnel, resulting in a supply of human resources that surpasses demand, thereby inducing greater unemployment, underemployment, and emigration.

A policy for training human resources is critically needed. Currently, health personnel training is conventional and uses expensive technology; moreover, some educational activities are outside the context in which the professionals will work. The training of physicians is done at five universities that have schools of medicine; the National University is the largest, having graduated 294 in 1982; 90 in 1983; 296 in 1984; 144 in 1985; 325 in 1986; and 191 in 1987. From 1981 to June 1987, the private universities graduated 1,619 physicians. The projections for the year 2000 show an estimated 6,000 graduated physicians; trends in employment opportunities for these physicians are not favorable.

The Manpower Education and Training Department of the Ministry of Public Health and Social Welfare, through the Section for the Training of Nursing Personnel, is responsible for training nurses and auxiliaries. There are three schools of nursing and five study programs for nurse auxiliaries. Most of these resources are used by the Ministry itself. In 1982, at the San Miguel school, a curriculum with a community-based approach and integration of education and service activities was set up. Nurses are trained through a four-year program: three years of theoretical and practical courses and one devoted to social service in institutions of the Ministry of Public Health and Social Welfare.

From 1986 to 1989, the three schools of nursing under the responsibility of the Ministry of Health were closed; the training of nurses remained the responsibility of the University of El Salvador and other institutions.

HEALTH AND THE ENVIRONMENT

Environmental health remained virtually unchanged throughout 1985–1988. However, important differences were observed between urban and rural areas in regard to drinking water supply and excreta disposal services. Approximately 39% of the total population has drinking water supply services. More than 90% of this population has household connections, while the rest have only easy access, especially in the rural areas. Sewerage services are provided to 23% of the population; in rural areas the coverage is 11%.

From 1985 to 1988, projects for increasing the coverage of drinking water supply services have run up against major problems related to the environment and the ecosystem, particularly deforestation, the lack of or noncompliance with environmental legislation, erosion, soil degradation, and the use of residual insecticides, the full impact of which will not be felt until some time in the future.

FRENCH GUIANA, GUADELOUPE, AND MARTINIQUE

GENERAL CONTEXT

Political, Economic, and Social Situation

French Guiana, Guadeloupe, and Martinique are both French regions and departments. French Guiana has a very low population density (0.9 inhabitants per km²); its 1986 population of around 84,000 is rapidly growing at an annual rate of 3.7% and is concentrated in the capital (Cayenne) and along the coastal plains. Guadeloupe and Martinique had 1986 populations of around 333,400 and 331,000, respectively; high population densities (198 and 307 per km²); and low annual population growth rates (0.2% and 0.4%).

Despite some differences, the three departments share many health problems. Unemployment and the marginal population settlements on the outskirts of the urban centers and in remote rural areas remain one of the main social problems.

Demographic Characteristics

A high birth rate (27.9 per 1,000 population in 1986) and immigration are responsible for French Guiana's population growth. Martinique has the lowest birth rate (18.0), but a downward trend observed since 1975 has leveled off due to an increase in the number of women of childbearing age; Guadeloupe's birth rate is 19.1 per 1,000 population.

French Guiana's rapid population growth has had important repercussions on health conditions and has led to additional resource requirements, an expansion of the maternal and child care services (the number of births doubled in 20 years), social and urban problems associated with rapid urbanization, and difficulties in providing access to health care services to scattered populations living in jungle areas. Displaced persons from Suriname, who began arriving in 1986, now represent 15% of the population.

In 1986, the percentage of the population under 15

years of age was 31.2% in Guadeloupe and 32.9% in French Guiana, where it continues to rise. This percentage has decreased to 25.6% in Martinique for that same year. Although the three departments have young populations, the situation is gradually changing, particularly in Martinique: the percentage of the population 60 years old and older was 7.0% in French Guiana, 10.6% in Guadeloupe, and 12.4% in Martinique.

Life expectancy at birth is estimated at 68 years for men and 75 years for women in Guadeloupe; 72 years for men and 76 years for women in Martinique; and 65 years for men and 74 years for women in French Guiana.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality

The three departments have similar crude death rates: 6.7 per 1,000 population in Guadeloupe, 6.5 in Martinique, and 5.7 in French Guiana. In 1986, infant mortality was 10.1 per 1,000 live births in Martinique, 15.3 in Guadeloupe, and 40.4 in French Guiana. Infant and perinatal mortality rates in the three departments fell considerably over the last 20 years; they continued to drop, albeit more slowly during 1981–1984.

The first three causes of death, in descending order, are cardiovascular diseases, cancer, and violent deaths (accidents, suicides, poisonings). Because of AIDS, infectious diseases once again rank as one of the leading causes of death.

Until 1982, the number of deaths caused by cardiovascular diseases, cancer, accidents, and diabetes rose, while those due to infectious diseases and perinatal causes decreased; the number of alcohol-related deaths remained fairly stable. Since then, the mortality rate for chronic diseases and accidents has risen only slightly, and alcohol-related deaths appear to have dropped slightly, undoubtedly contributing to an increase in life expectancy. However, this progress has already been offset in the three

departments by the AIDS situation which, alone, is expected to bring about a reduction of life expectancy in the next three years.

Child Health

The health status of this population group showed great improvement during the last ten years. Infant mortality, however, has remained unchanged in French Guiana, and the perinatal mortality rate did not improve over the past three years. Perinatal morbidity and mortality could be further reduced with improvements in birthing conditions, more access to prenatal monitoring, and better prenatal care.

Accidents are a major cause of death among children; 85% to 90% of children have oral health problems; and handicaps, particularly mental handicaps, are a heavy burden on the health care delivery system. On the other hand, diarrheal diseases, acute respiratory diseases, and intestinal parasitosis no longer pose serious problems. Malnutrition occurs only among some isolated minorities in French Guiana, and acute rheumatic fever is clearly on the decline.

Given the predominance of heterosexual transmission of AIDS and the high ratio of women with the disease (one woman for every two men), pediatric AIDS is beginning to reach serious levels (30 cases up to 30 June 1988). In 1987, as many HIV-infected children were born in French Guiana, Guadeloupe, and Martinique as were born with sickle cell anemia (2 per 1,000).

Marginal populations—ethnic minorities and populations living on the outskirts of major cities and in some rural areas—require special attention. Services for handicapped children need to be further improved and cavity-prevention activities need to be undertaken on a large scale.

During 1982–1987, major efforts were made to improve vaccination coverage and its evaluation. However, a system to continually assess vaccination coverage has yet to be established.

Health of Adults

Each year, about 1% of the departments' population is injured in traffic accidents. Alone, these accidents constitute the main cause of the loss of potential years of life between the ages of 1 and 75. Although other accidents (domestic, recreational, or industrial) are also important causes of morbidity and mortality, they have not been studied as much.

Cardiovascular diseases are the main cause of death in the three departments and account for 10% of hospital admissions. High blood pressure and its complications are most common, while heart disease is relatively infre-

quent. A survey conducted in Guadeloupe indicated that 20% of the adult population had high blood pressure.

Cancers account for 8% of hospital admissions in Guadeloupe and Martinique. Studies carried out on Martinique's cancer registry indicate an annual incidence of 225 cancer cases per 100,000 population for males and 171 cases for females. The most common cancer sites among men are the prostate (25%) and the mouth and pharynx (13%). Among women, uterine (28%) and breast cancer (20%) are most frequent. The incidence of cancer of the lungs, colon, and rectum is extremely low.

Approximately 2% of the population suffers from mental illness, and about 20% of hospital beds are occupied by mental patients. Alcoholism and its direct (neuropsychiatric and hepatic) consequences represent an important cause of morbidity, accounting for 10% of hospital admissions. Efforts to combat alcohol abuse were developed over the last five years, leading to a reduction in alcohol-related deaths between 1982 and 1987.

Diabetes is also a major cause of morbidity, affecting 6% of the adult population in Guadeloupe. Due to the high prevalence of both high blood pressure and diabetes, chronic kidney failure also is a serious problem.

A specific effort has been undertaken to prevent traffic accidents; however, much remains to be done in chronic disease prevention, such as prevention of cancer-related deaths among women through early detection and treatment of breast and cervical cancers. In all three departments, the prevention of cardiovascular disease requires addressing high blood pressure and diabetes. Diabetes and obesity are closely linked, and both play a role in the onset of cardiovascular diseases. Primary prevention efforts already under way include the conduct of carefully controlled and evaluated nutritional education activities to promote low-sugar and low-fat diets. If successful, these activities may be expanded to reach most of the population.

A recent study in Guadeloupe indicated that 90% of persons with high blood pressure and 80% of diabetes cases had already been detected by physicians. However, only one out of five high blood pressure patients followed the prescribed treatment properly.

Health of the Elderly

The elderly population is growing, particularly in Guadeloupe and Martinique. The main health problems among this age group are chronic illnesses, particularly cardiovascular diseases (heart failure, high blood pressure, cerebrovascular disease), which account for 40% of deaths among those 60 years old and older, and cancer and diabetes, particularly among women. Accidents and alcoholism are no longer a major cause of morbidity or mortality among this age group.

A recent study conducted in Martinique indicated that age-related mental problems are the main cause leading to the confinement of elderly persons in specialized facilities.

Problems Affecting the General Population

Natural disasters spared the three departments in 1982–1987. However, the threat of hurricanes, earthquakes, and volcano eruptions requires that emergency disaster relief plans be kept current. French Guiana, Guadeloupe, and Martinique have signed agreements with neighboring countries to coordinate disaster relief efforts.

Tuberculosis is a low level endemic in Martinique and Guadeloupe (15 cases per 100,000 population) and is higher in French Guiana (80 cases per 100,000). The incidence and severity of ancylostomiasis, anguilluliasis, and ascariasis have decreased, particularly in Guadeloupe and Martinique. Bilharziasis is disappearing from Guadeloupe and Martinique, and is nonexistent in French Guiana. In this last department, leishmaniasis affects forest-dwelling populations, particularly new arrivals.

If current trends hold, tuberculosis, leprosy, and intestinal parasitic diseases are expected to fall to residual levels in the next 15 years. The incidence of acute rheumatic fever also appears to be diminishing; prevention programs are being consolidated.

The number of malaria cases has increased in French Guiana since 1970 (1,050 cases in 1983; 1,445 in 1986; 3,233 in 1987); the disease is chloroquine-resistant. The organization of a malaria control program is critical for French Guiana.

Dengue is currently endemic. Efforts to control dengue and yellow fever were revised after the development of emergency plans to deal with a potential epidemic. Broader mosquito control efforts are under consideration.

The most important recent health problem has been the emergence of AIDS in the departments since 1982. In French Guiana, Guadeloupe, and Martinique, AIDS epidemiology is characterized by the predominance of heterosexual transmission (87%), with homosexual (8%) and intravenous drug use (1%) transmissions representing a small percentage of cases. AIDS is currently the first health priority in the three departments. In 1987, 81 new AIDS cases were reported (25 in French Guiana, 37 in Guadeloupe, and 19 in Martinique).

Each department established an AIDS prevention and control program designed to stem the transmission of the human immunodeficiency virus. These programs pursue four strategies: epidemiological surveillance, prevention of sexual and perinatal transmission, hospital and profes-

sional hygiene and safety, and reduction of HIV-related morbidity and mortality.

Although the prevalence of sexually transmitted diseases is difficult to determine, a new and considerable upsurge was observed since the 1970s. In 1987, this phenomenon leveled off and then declined, probably due to behavioral changes brought about by the fear of AIDS.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

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, alcoholism 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 region level is responsible for materials, equipment, and research.

Most health activities, such as 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.

During 1982–1987, integrated health actions in research, treatment, and prevention were implemented according to defined priorities and a better knowledge of the health conditions of the populations. This strategy was pursued in the fight against AIDS and should be expanded in the future, particularly regarding chronic diseases.

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. 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 with the assistance of 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-à-Pitre (Guadeloupe). Some patients requiring special care may be transferred to larger centers in France or elsewhere.

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.

Both Guadeloupe and Martinique 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.

Drugs are supplied by private pharmacies (at least one per commune) and by the 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; control of *Aedes aegypti*; 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 health education, alcoholism, family planning, and AIDS.

Medical/social facilities screen and care for handicapped children and adults. Although these facilities recently have achieved significant gains, handicapped children and adults still are transferred to France.

During 1982–1987, applied research activities were organized in epidemiology, immunology, parasitology, bacteriology, entomology, virology, and genetics. Research activities increased as the National Health and Medical Research Institute was decentralized.

Regional health observation posts created in the three departments gather and disseminate health-related data to help maintain the epidemiological surveillance of the population and to participate in the decision-making process.

The total 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 obstetric services; 15% are occupied by psychiatric patients; and 10% by convalescence or rehabilitation patients.

The modern regional hospital centers in Fort-de-France and Pointe-à-Pitre opened during 1982–1987. Public hospitals in French Guiana and Guadeloupe are being upgraded, but many remain outdated.

Equipment such as hemodialysis units, particle accelerators, gamma scintillation cameras, ophthalmic lasers, and scanners gradually has been acquired, cutting back on the number of patients who need to be transferred to France.

Financing of the Health Services

The social security system covers 80% of medical care expenses, which are 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, which began in 1979, were intensified during 1982–1987. Given this department's population growth rate of 4% per year, the health needs of French Guiana in particular will be difficult to meet without an increase in resources.

In the past, growing health sector budgets allowed both the acceleration of efforts to make up for lost ground and the creation of units to deal with emerging problems. That 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.

Given the health system's complexity, joint actions undertaken by the State, region, and department are likely to be most effective and to use resources more efficiently.

Human Resources

The three departments show similar ratios of selected types of health human resources per 10,000 population (Table 1); these ratios have increased rapidly over the past 15 years. In 1986, there were about 15 physicians per 10,000 population (60% of them general practitioners and 40%, specialists), twice the number for 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

TABLE 1

Selected types of health human resources per 10,000 population, French Guiana, Guadeloupe, and Martinique, 1986.

| | French Guiana | Guadeloupe | Martinique |
|-------------|---------------|------------|------------|
| Physicians | 17.7 | 14.7 | 15.7 |
| Nurses | 53.9 | 35.0 | 34.1 |
| Dentists | 4.8 | 3.4 | 4.1 |
| Pharmacists | 4.2 | 5.0 | 5.0 |

around four dentists per 10,000 population in 1986 and their number also doubled from 1972 to 1986.

The ratio of nursing personnel per 10,000 population was around 35 in 1986. Although the number of nurses also doubled between 1972 and 1987 due to the creation

of many public sector jobs (primarily in hospitals) in the early 1980s, this trend slowed from 1982 to 1984.

The ratio of midwives varies from 22 per 1,000 births in Martinique, to 14.2 in Guadeloupe, and 11 in French Guiana; Martinique's midwife training facility accounts for the high ratio there. The number of midwives grew by a factor of 1.5 from 1972 to 1983.

Training programs offered in association with the larger hospitals provide on-the-job training for nursing and auxiliary personnel.

There were five pharmacists per 10,000 population in Guadeloupe and Martinique and 4 per 10,000 in French Guiana, most of whom have their own pharmacy. The number of pharmacists doubled from 1972 to 1986.

It was decided to establish a training and research unit in the departments to handle the final stages of training for medical students completing their studies. The first part of their training is still to be provided in France.

GRENADA

GENERAL CONTEXT

Political, Economic, and Social Situation

Grenada is a constitutional monarchy with a parliamentary democracy. The Governor General is the representative of the Government of the United Kingdom, and the Prime Minister, who appoints and heads the Cabinet, is the head of Government. The Cabinet is responsible to the Parliament.

GDP grew from \$US82.3 million in 1983 to \$US99.5 million in 1987, and per capita income rose from \$US890 to \$US960 in the same period. The GDP from tourism increased from \$US3.7 million in 1983 to \$US7.0 million in 1986. Agriculture was the main contributor to the GDP at \$US18.9 million in 1986. The external debt was \$US43.2 million. Throughout 1983–1987, imports exceeded exports. This deficit was met by capital inflows from external services and external loans. The rate of inflation decreased from 10.7% in 1983, to 4.9% in 1985, and to –0.6% in 1986.

Structural adjustment policies have been implemented by the Government. Unemployment is high, but current estimates are not available. Adult literacy is 99%.

Demographic Characteristics

The population is estimated to have grown from 96,030 in 1984 to 103,400 in 1987; annual population growth was estimated to be 1.2% in 1987. The population is young, with 37.2% being under 15 years old and only 7.1% over the age of 65.

Birth rates have remained above 30 per 1,000 population. The estimated birth rate was 30.3 per 1,000 population in 1987 and 30.9 in 1985. Fertility rates are relatively high, reaching about 140 per 1,000 women aged 15–44 in 1987.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

Health Situation of Specific Population Groups

Child Health

The infant mortality rate has decreased from 18.1 per 1,000 live births in 1985 (56 deaths) to 14.7 in 1987 (45 deaths). The leading causes of infant death are prematurity, congenital anomalies, and respiratory infections. The main reasons for hospital admissions in children under 5 years of age are gastroenteritis, respiratory infection, and hernias.

Immunization coverage for children under 1 year old rose dramatically from 61% for DPT and 77% for polio in 1985 to 98% and 92%, respectively, in 1987. Measles coverage was 77%. Rubella immunization for schoolchildren has been established.

Health of Adolescents and Adults

The increasing adult population has paved the way for the predominance of chronic noncommunicable diseases as the leading causes of mortality and morbidity. In descending order of importance, heart disease, cerebrovascular disease, and malignant neoplasms rank as the leading causes of death. Diabetes and hypertension are the fifth and eighth causes of death, respectively, but their contribution to both heart and cerebrovascular diseases should not be underestimated. Accident-related deaths are increasing. Cervical cancer has been identified as the leading malignancy among females. Among males, the leading malignancies are gastric cancer and prostate cancer.

Facilities for mental health care delivery have improved

in recent years, and a unit has been established to help rehabilitate persons who need treatment for substance abuse.

Maternal deaths (two per year in 1985, 1986, and 1987) are equivalent to a maternal mortality rate of 6.4 per 10,000 live births. The percentage of total births delivered to teenage mothers was 23% in 1985 (726 births), 21% in 1986 (677 births), and 25.7% in 1987 (800 births). Family planning services have become available at all the country's clinics.

Health of the Elderly

At present, the elderly constitute approximately 7% of the population, but this figure is likely to reach 10% by the end of this century. Custodial facilities for the care of the elderly are available. There is scanty documented information on the health of the elderly.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

The Ministry of Health is responsible for providing public health services in the country. Policy decisions are made by the Minister of Health on the advice of the Permanent Secretary for health and of the senior technical officers. Day-to-day management is under the responsibility of the Permanent Secretary and, through him, of the technical and administrative staff within the Ministry, hospitals, health centers, and health clinics. The Ministry of Health works closely with the Ministries of Agriculture, Education, Works, and Finance. Since tourism is a key area, maintaining a safe, healthy, and attractive environment is a priority.

Grenada's health system has developed over several years, and incorporates a combination of primary, secondary, and tertiary levels of health care services. The commitment to these levels of care is based on the Ministry of Health's draft "Health Policy and Health Development Plan, 1983-1985," which emphasizes the use of primary health centers throughout the island and the development of clinics and outreach programs.

Although the levels of health care have not been officially defined, usually primary health care means health care at or from the health clinics, from general practitioners, and at outpatient departments in general hospitals. The terms secondary care and tertiary care are not normally used, but "secondary" generally refers to inpatient care at all health institutions and "tertiary" care to specialist care at the general hospital or abroad. The three levels of care are organized at the community level, at the district level, where there is coordination with other sec-

tors and communities, and at a central level, where activities are coordinated by the national health care committee, chaired by the Minister. A planning, monitoring, and evaluation unit in the Ministry is responsible for coordinating the activities of teams from all three levels of care. In addition, this unit works with the primary health care committee to ensure incorporation of primary health care strategy into the approach used by teams at each level.

Access to health care is considered good. There are no cultural or economic barriers to the health services, as all public health services are free. Community health facilities (health centers, health/medical clinics, and health stations) are located in population centers, so that nobody should have to walk more than three miles to get to one. However, with the growth of towns and villages over the years, some persons are beyond the three-mile limit; in addition, in some parts of the country access is difficult because of the rugged terrain and because of infrequent or nonexistent transportation. The population served per health clinic is approximately 5,000, except in Carriacou and Petit Martinique where there are fewer persons per clinic.

Primary health care is provided through a public system of 6 health centers, 27 visiting stations, 1 outpost clinic, 1 maternity center, 8 dental clinics, and 6 hospitals. The hospital system consists of a main multidisciplinary hospital (General Hospital) in the capital (240 beds), a smaller general hospital in a rural area (40 beds), a general hospital in Carriacou (32 beds), a psychiatric hospital (160 beds), a geriatric hospital (137 beds), and a sanatorium (25 beds). There are two special facilities, one for the handicapped and one for drug addicts, with 16 beds each. The mental hospital, which originally had 160 beds, was extensively damaged in the 1983 armed combat, and a new hospital of 80 beds is being built; 26 acute beds also are being added at the General Hospital. The private sector provides significant institutional care, including two nursing homes and one acute general hospital with 10 beds.

No satisfactory referral system exists, however, nor is there a coordinated system for the management of patient care. Patient referral by the nurse at the clinics may be to the district medical officer, to the family nurse practitioner, to the maternity unit, or, in an emergency, to the General Hospital. Referral of patients from the hospital to the district medical officer or to the health clinic nurse is in general very poor, except for pediatrics, where a system using a special form is in operation. Although there are two hospitals on the island of Grenada and one in Carriacou, only the General Hospital in St. George's has major facilities; consequently, referral for the most serious cases means referral to the General Hospital. Transportation sometimes presents problems, and mov-

ing patients from Carriacou and Petit Martinique involves both sea and air transportation.

Patients needing care unavailable in Grenada are sent abroad with help from or by the Government; patients who can afford to, make private arrangements. Patients mainly go to Barbados, Trinidad, and the United States.

Health services are financed largely from general revenue. Essential supplies (drugs, medication, and equipment) are all imported. An analysis of manpower shows a shortage of primary care personnel.

HEALTH AND THE ENVIRONMENT

Since the change of government a few years ago there has been considerable economic development. Following the completion of the jet airport at Point Saline in the southwest, hotels and other tourist facilities have increased.

With considerable external assistance, infrastructural systems have been improved and more residential, agricultural, and industrial development has been encouraged. The environmental health program remains undeveloped and out of date, however. Much of the residential area in St. George's is not sewered, and these areas and those to the south in the Grand Anse region suffer from septic tank effluent run-off, unsanitary latrines, and lack of any excreta disposal facilities. Coastal hotels and other buildings discharge partially treated effluents into the lovely Grand Anse Bay.

Increased tourist and local activity generates more solid waste. Urban littering, countryside dumping, and unsan-

itary disposal at the landfill site at Perseverance (north of St. George's) are commonplace problems. A new disposal site and a master plan are important needs for upgrading the solid waste management program.

The one-to-two-mile-long Grand Anse Beach and others, such as Grenville, are severely polluted by onshore solid and liquid wastes and by ship discharges. In addition to the threat to bathers and to tourism, coral reefs also are endangered. In both the short and long term, the country cannot afford further coastal pollution.

The Central Water Commission is in the process of becoming a water and sewerage authority, and this should provide adequate technical and administrative support for sewerage sector development. Environmental and development laws are in the process of review and updating: if enforced, these laws would do much toward establishing firm environmental health management.

Water supply developments, assisted by the Caribbean Development Bank, UNDP, and others, are continuing. The sewerage system in St. George's has been improved through a Canadian International Development Agency (CIDA) project, and USAID-assisted studies have begun for a Grand Anse collection sewer and marine outfall sewer from Point Salines. The Caribbean Environmental Health Institute, based in Saint Lucia, has assisted in developing local coastal pollution monitoring capability.

Regarding vector control, a vertical program inspects and carries out focal/perifocal treatment throughout the island at intervals of eight to ten months. Some fogging is carried out. A Peace Corps Volunteer attachment provides assistance to develop integrated, community-based approaches to control. The latest *Aedes* household infestation index (1988) was 10.6%.

GUATEMALA

GENERAL CONTEXT

Political, Economic, and Social Situation

The Government of Guatemala's separation of powers follows the classic liberal pattern: the legislative branch, whose principal body is the Congress of the Republic, is composed of representatives; the executive branch consists primarily of the Presidency of the Republic and the ministries of state, the Council of Ministers, and the Council of State (decentralized entities also come under the Executive); and the judicial branch is made up of the Supreme Court and lower courts.

The country is divided into 22 departments and 330 municipalities. For the administration of public services, the country is organized into technical districts, areas, and eight regions.

After the 1980–1985 crisis, the economy has shown signs of recovery. Stabilization began in 1986 and reactivation in 1987, with a 3.1% growth of the gross national product (GDP); by 1988, this growth had increased to 3.5%. Growth for 1989 was projected to be 5%. The stability of the exchange rate after the 1986 devaluation has allowed for a considerable reduction of inflation. Despite this, it was impossible to prevent the continuing decline of the per capita income, and the benefits of growth have not been evenly distributed.

The objectives and goals of the 1989 economic program include: promoting conditions that will increase economic activity (5% increase in the GDP compared with the previous year); reducing the imbalance in the external sector and increasing foreign exchange reserves; reducing the overall fiscal deficit to 2.5% of the GDP; controlling growth of the money supply and inflation; reducing unemployment; and carrying out a wage adjustment.

The external public debt is approximately \$US42.5 billion. Between 1982 and 1986, debt service payments increased from 8% to 24% of all goods and services exports.

According to a national survey of income and expenditures (1980–1981) and to estimates of the cost of the basic food basket, 40% of the total population and 52% of the rural population do not earn enough to meet

nutritional needs. Seventy-one percent of the total population and 84% of all rural residents live in poverty or extreme poverty (2.6 million people), with incomes that do not cover the price of the basic food basket or of basic goods and services (General Secretariat of the National Council for Economic Planning—SEGEPLAN).

According to SEGEPLAN, some 250,000 families subsist on farms smaller than 10 *manzanas* (1 *manzana* = 0.69 hectares) and 200,000 families of unskilled agricultural wage earners live in poverty.

The most densely populated rural areas are in the mountainous region, where most of the Indian population lives on small landholdings. They speak many different languages (ten languages and at least 200 dialects), which makes communication difficult. The last agricultural and livestock census (1979) showed that 89.8% of the agrarian properties were very small minifundios, known as *microfinchas* (smaller than one *manzana*), and family farms (from 1 to 10 *manzanas*), which together represented only 16.3% of the country's territory, while medium and large multifamily farms represented 65.4% of the productive land.

In 1986, 42% of the economically active population had no schooling, while 25% only had completed the first three grades. According to SEGEPLAN, total unemployment reached 44% in 1987. Underemployment (31.7%) is the country's principal occupational problem. Furthermore, much of the work force is unskilled and untrained. According to 1987 projections, 86% of the employed population was male.

In rural areas, it is estimated that between 500,000 to 1,500,000 persons migrate in the course of agricultural activities. These migrations are seasonal, and information about them tends to be incomplete. Coffee, cotton, and sugarcane are the main crops that attract most rural workers and that provide them with income for family maintenance. The coffee harvest, from August to March, employs the largest work force. Most workers are hired from September to November, with up to 220,000 temporary workers employed at the peak. The cotton harvest is from November to March, but the largest labor demand comes during December and January. Sugarcane is harvested from November to May. The combined labor force to harvest these three products amounts to some 400,000 additional workers, many of whom travel with their fam-

ilies. Work contracts average 30 days. The Department of El Petén is considered one of the main areas for attracting migrants.

Demographic Characteristics

The 1989 estimated population of 8,935,394 inhabitants lives throughout the country's 108,889 km². The most populated portion of the country is Guatemala City, with 1,908,085 inhabitants living in an area of 2,126 km². Of the total population, 62% lives in 19,000 localities of fewer than 2,000 inhabitants each, which represent 90% of the country's towns and settlements. This situation poses problems for this population's access to different social services.

Of the total population in 1987, 32.7% was urban and 67.3% rural. Approximately 50.6% was male and 49.4% female; in 1989, the male-to-female ratio was estimated at 102:100. The population under 5 years of age represents 17.6% of the total, while those under age 15 account for 46% (approximately 4.1 million). Half the population is under age 17. Adolescents (age group 10–19 years old) number 2.1 million (23.6%), almost one-fourth of the total population. Youths (age group 15–24 years old) number 1.7 million, representing almost one-fifth of the population (19.4%). The elderly represent only 3.1%. These characteristics make Guatemala a demographically young country with a population pyramid broad at its base.

In 1989, women aged 15 to 49 numbered almost two million (21% of the total population). In 1985, 16% of all births were to mothers under 20 years of age and 79% to mothers aged 20 to 30. Births to mothers 40 and over represented 5.4% of total births. The 1987 national maternal and child health survey indicated that 20% of women aged 15 to 19 do not wish to have more children. In the 25–29-year age group, this figure is 50%. These data suggest a large potential demand for family planning services. Women are heads of household in 14.4% of all homes (1981).

In 1987 a total of 308,307 births were registered, for a birth rate of 36.5 per 1,000 population and an overall fertility rate of 180 per 1,000 women of childbearing age. Of all births, 23% occur in hospitals and 77% at home.

According to the 1981 census, the ethnic breakdown of the population was 41.9% Indian and 58.1% Ladino (mixed). The percentage of Indians in the population varies among the departments, ranging from 97% in Totonicapán and 61% in Quetzaltenango, to 12% in Guatemala City and 0.68% in El Progreso.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

Life expectancy increased in 1985–1990, and is now estimated at 60 years for men and 64 years for women. The overall mortality rate for 1987 was estimated at 8.1 deaths per 1,000 population.

In 1987, 68,311 deaths were registered; 56% were males and 44% females, with a male-to-female ratio of 1.3:1. Deaths in the 50 years and over age group accounted for 34.3% of the total.

Analysis of the principal causes of death should consider access to health services by different population groups. For example, in South Guatemala, Totonicapán, Quiché, San Marcos, Chimaltenango, Alta Verapaz, Baja Verapaz, and Huehuetenango, less than 10% of all deaths occurred in hospitals; most of the remainder occurred at home. At the national level, 75.6% of all deaths occurred at home, 19.1% in hospitals, 4% in public thoroughfares, and 1.3% in nursing homes.

Nationwide, 42.9% had had no medical care prior to death; 32.8% had been attended by a physician; 21.6%, by healers; and 2.7%, by midwives. Since 1950, the percentage of deaths that had received medical care increased, from 11.5% in 1950 to 32.8% in 1987. In North Guatemala 50% of the population receives medical care. In Amatitlán, Zacapa, Sacatepéquez, and South Guatemala, 48.6%, 45.4%, 44.2%, and 40.7% of the population, respectively, receives medical care.

Of total deaths, 48.5% are certified by physicians, 34.1% by a municipal authority, and 10.3% by personnel outside the health sector; 7.1% are not certified at all. The difficulties faced in death registrations are clear, as is the questionable reliability of the data. When it is confirmed that the death was medically certified even though the patient did not receive medical care, the information becomes even less trustworthy, especially in those cases where the person certifying the death is outside the health sector.

Deaths and births are registered where they occur. In North Guatemala approximately 60% of all registered deaths are of persons who normally resided elsewhere; in South Guatemala this percentage is 0.7%; in Amatitlán, 10.2%; and in the rest of the country, 11.2%.

The principal causes of death are: diarrhea (with a rate of 14.4 per 10,000 population); acute respiratory infections (11.2); malnutrition (5.2); disorders of fluid, electrolyte, and acid-base balance (2.3); acute myocardial infarct (1.6); accidents caused by sharp instruments (1.6); ill-defined acute cerebrovascular disease (1.1); cardiac

dysrhythmia (1.0); pulmonary tuberculosis (1.0); and fight, brawl, or rape (0.9). Infectious and parasitic diseases account for more than 40% of all deaths.

In 1986 the ten main causes of morbidity, based on the nationwide demand for services provided by the Ministry of Public Health and Social Welfare, were: acute respiratory infections, intestinal parasitism, diarrheal syndrome, nutritional deficiency, diseases of the skin, bronchopneumonia, peptic disease, urinary infection, anemia, and amebiasis. These causes account for approximately 47% of all consultations.

In 1986 the outpatient services of the Guatemalan Social Security Institute recorded the following causes of morbidity: diseases of the respiratory tract (32.1%); infectious and parasitic diseases (23.0%); diseases of the digestive system (11.2%); and, in the following order, diseases of the skin and subcutaneous tissue; diseases of the nervous system and the sense organs; diseases of the musculoskeletal system and connective tissue; diseases of the genitourinary system; endocrine, nutritional, and metabolic diseases and immunity disorders; diseases of the circulatory system; and diseases of the blood and blood-forming organs.

Health Situation of Specific Population Groups

Child Health

Infant mortality held steady in 1988 at an estimated 51.3 per 1,000 live births. Infant mortality ranges from 81.4 per 1,000 live births in the Department of Escuintla to 36.0 in the Department of Chiquimula. Neonatal mortality was 17.2 per 1,000 live births. The principal causes of infant mortality are: diarrhea (23.8%); acute respiratory infections (23.6%); malnutrition (4.3%); diseases originating in the perinatal period (4.1%); and disorders of fluid, electrolyte, and acid-base balance (3.2%). All told, these causes account for 59% of the total deaths in this age group. Approximately 5.3% of infant deaths were attributed to ill-defined causes. Some 4.3% of the deaths from malnutrition occur in children under age 5.

In 1987 the perinatal death rate was 28.6 per 1,000 live births. The five principal causes of death were: certain conditions originating in the perinatal period (termination of pregnancy, 80% of the deaths) (760–779); intrauterine hypoxia and birth asphyxia (including fetal deaths from asphyxia or anoxia at the onset of labor or at an unspecified time) (768); infections specific to the perinatal period (including tetanus neonatorum, among others) (771); disorders relating to short gestation and other forms of low birthweight (764–765); and other respiratory diseases of the fetus and newborn (770). Of

a total of 308,307 births, there were 8,808 perinatal deaths, 280 of them due to ill-defined causes.

The death rate in children 1–4 years old is 8.4 per 1,000. The five leading causes of death are: diarrhea; acute respiratory infections; malnutrition; disorders of fluid, electrolyte, and acid-base balance; and intestinal parasitic diseases. These causes account for 70% of all deaths in this age group.

The results of the national census (published in September 1986), which covered first-grade schoolchildren, or children ages 6 to 9, revealed that the overall percentage of children with malnutrition is 37.4%. In some departments it is estimated that malnutrition affects most children included in the census: 64.6% in Sololá, 60.9% in Totonicapán, 52.9% in Baja Verapaz, 52.9% in El Quiché, 52.0% in Chimaltenango, and 51.8% in Huehuetenango.

In 1985, the vaccination coverage survey showed that the proportion of children who had had all their vaccinations was very small and that EPI vaccine coverage was too low to protect the infant population, especially those children aged under 1 year. National vaccination days were held in 1986, reaching coverage levels of 34.9% for polio, 33.3% for DPT, and 48.8% for measles. In 1987, partly due to the fact that no vaccination days were held, coverage in children under 1 year of age with the three vaccines was 17.6%, 15.8%, and 24.3%, respectively. In 1988 it was decided that two national vaccination days would be held and that a process of accelerated vaccination would be implemented at all operational levels of the health system. These measures increased coverage with the three vaccines in children under age 1 to 58.1%, 48.5%, and 55.2%, respectively.

During 1988, as a result of improvements in the epidemiological surveillance system, 84 cases of flaccid paralysis were reported in children under 15 years of age and registered as probable cases of poliomyelitis; 42 (50%) were confirmed according to criteria of the Poliomyelitis Eradication Program. These cases occurred in 28 municipalities, 8.4% of the country's 330 municipalities. Of all confirmed cases, 58% were in the departments of Guatemala, Escuintla, and Chimaltenango.

Maternal Health

The maternal death rate in 1987 was 10.4 per 10,000 live births, with a downward trend compared with previous years. This figure is influenced by the low coverage of death certifications by qualified personnel, which affects the quality and accuracy of the diagnoses and, in turn, the classification of female deaths as maternal mortality.

Complications of labor constitute the leading cause of maternal death, accounting for 56% of all causes, fol-

lowed, in descending order, by complications of pregnancy (14%), puerperal sepsis (12.5%), and abortion (11.5%). The 1987 national maternal and child health survey indicated low levels of protection from tetanus in pregnant women: only 14% of births in the last five years were by mothers who had received tetanus toxoid. Protection is lowest in Indian groups.

The proportion of pregnant women who have received professional prenatal care, was one-fourth in rural areas and 57% in urban areas. Only 17% of Indian women received prenatal care. Of pregnant women without education, 18% received professional prenatal care, while 86% of the pregnant women who have attended secondary school received such care.

In urban areas, 58% of births were attended by professionals, compared to barely 18% in rural areas. Of Indian women, 10% had professional care during delivery. The national average of deliveries that are attended in institutions is 22%.

The family planning program aims at decreasing maternal and infant mortality. The results of the 1987 national maternal and child health survey indicate that 70% of all women are familiar with or have heard of some contraceptive method. Among married women (or women living in consensual unions), the percentage is practically the same (72%). Of all women, 0.2% were only familiar with a traditional method and not with any modern method.

The female population of reproductive age (15–49) presents some characteristics that have been well defined in the document “Demographic Aspects in Guatemala: Where We Are Headed, 1982”:

- The very high fertility group (six or more children) comprises 59.2% of the women of reproductive age and accounts for 70.9% of all live births. These women are mainly engaged in agriculture (85.8%), they are uneducated (98%) or have not gone beyond a third-grade education, and they live in agricultural areas (90.3%).

- The high fertility group (5 to 5.9 children) corresponds to 12.5% of all women of reproductive age and accounts for 13.3% of live births. These women work in nonagricultural activities (68.9%), tend to be uneducated or have at most a third-grade education (63.1%), and live predominantly in nonmetropolitan urban areas (50.9%) or in rural areas (34.3%).

- The mid-level fertility group (4 to 4.5 children) represents 13.9% of the women of reproductive age and accounts for 10.1% of all live births. These women work in nonagricultural activities (87%), they often have had four to six years of schooling (69.3%), and live predominantly in the metropolitan area (62.7%).

- The group with the lowest fertility (3 to 3.9 children) represents 14.4% of the women of reproductive age and accounts for 7.7% of the live births. Most live in the

metropolitan area (69%), 88.9% have had at least seven years of schooling, and only 4.7% work in agriculture.

In 1987 the overall fertility rate was 180 per 1,000 women of childbearing age. The rate varies by department; the highest rates, in Quetzaltenango, El Petén, Jalapa, Totonicapán, and San Marcos, range from 43.7 to 41.4 per 1,000 population. Of all births, 95% were to women ages 15 to 39, with 53% among women from 20 to 29 years of age.

Problems Affecting the General Population

The numbers of reported human immunodeficiency virus (HIV) infections, patients with AIDS-related complex, and confirmed cases of AIDS have increased rapidly since the second half of 1984, when the first cases were detected in the country. In 1984 two cases and two deaths were recorded; in 1985, five cases and five deaths; in 1986, ten cases and nine deaths; in 1987, thirteen cases and nine deaths; and in 1988, eighteen cases and ten deaths.

Morbidity from pulmonary tuberculosis, bacteriologically confirmed, ranges from 1.8 to 1.2 for every 1,000 persons examined. The rate of infection has been reduced by more than 66% in the last 25 years; case fatality has fallen from 25% to 15% in the last five years; and the rate of deaths due to pulmonary tuberculosis in 1986 was 9 per 100,000 population. For 1988, this rate was estimated at 8,000 to 12,000 cases of bacilliferous tuberculosis and no less than 700 deaths yearly due to that disease.

The country has been divided into three ecological areas. The southern ecological area (along the Pacific coast), which includes the coastal plain between the massif and the sea, is the most agriculturally developed; cotton, sugarcane, and soybean crops are raised here, as well as livestock. This region receives large-scale migrations of inhabitants from the highlands, who are a high-risk population for malaria. The principal vector is *Anopheles albimanus*. Up to 1982 more than 60% of all cases were in that region, but use of the insecticide pyrethroid, coupled with epidemiological stratification efforts, apparently has reduced the incidence of the disease.

The northern ecological area has the heaviest rainfall and includes forested regions interspersed with extensive plains where corn, beans, and cardamom are grown. *Anopheles albimanus* is the principal vector for malaria, but *A. pseudopunctipennis* and *A. vestitipennis* are also significant vectors, at least as secondary transmitters. The population has a large Indian component, and intense colonization is currently taking place.

The east-central ecological area includes the departments bordering on El Salvador and Honduras, and is

characterized by arid lands and low rainfall; malaria here is unstable and responds well to the control measures taken against the vector. The principal vectors are *A. albimanus* and *A. pseudopunctipennis*.

In 1986 there were 42,609 malaria cases; in 1987, 57,662. The northern ecological area is the most affected, with 63.2% positivity, followed by the south, with 22.9%, and the east-central area, with 13.9%. *Plasmodium falciparum* accounts for 5% of all positive cases.

More than half the national territory (51.5%) is classified as being at risk of becoming a reservoir of *Aedes aegypti*; therefore, dengue could affect as much as 64% of Guatemala's total population. The 1987 annual report of the Malaria Division shows that in the last 15 years, cases of dengue have been detected in only 582 of the 8,669 localities at risk. Currently, the exact number of cases is unknown, but there are reports of suspected outbreaks. In 1981, serological analysis was negative in 100 samples studied. In 1982, dengue 1 and dengue 2 were detected. From 1982 to 1987, no serological diagnoses were performed; by late 1988 and early 1989, results were obtained that virtually confirm a renewed outbreak of the disease. In 1987, dengue serotype 2 was identified.

The southern Pacific coastal region and the eastern area are the backbone of the country's economic development. It is in these regions where outbreaks have occurred in small localities; for the time being the large population centers do not seem to have any local transmission.

The Malaria Division has an *A. aegypti* control program, but available resources are inadequate, considering that dengue is a vector-borne disease, that the entire population of the affected areas potentially runs the risk of contracting the disease, and that the disease is reduced to holoendemic levels according to the reduction of *A. aegypti* density.

In 1987, an outbreak in Livingston, Izabal, spread to the departments of Zacapa, Chiquimula, and El Progreso; it subsequently affected areas in the Pacific slope, with small-scale outbreaks in the departments of Escuintla, Suchitepéquez, Retalhuleu, and the coastal sections of Quetzaltenango and San Marcos. In 1988, about 30 detected outbreaks of dengue affected some 5,000 inhabitants.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

The health system has not changed structurally in recent years. It includes: (a) the Ministry of Public Health and Social Welfare, which is responsible for the health

of the population and heads the sector and encompasses the nursing schools and the centers for training Ministry technicians, traditional midwives, health promoters, committees of community leaders, and other volunteer groups; (b) the Guatemalan Social Security Institute (IGSS), which provides medical care to affiliated workers and their dependents; (c) the municipalities, which are responsible for urban water supply and for disposal of solid wastes and excreta (in the rural area the Ministry of Public Health is responsible); (d) the military health service; (e) San Carlos University and its schools of medicine, dentistry, and pharmacy and the regional school of sanitary engineering; and (f) the private sector, made up of nonprofit entities such as the Red Cross, the National Tuberculosis League, the National Cancer League, the Anti-Alcoholism Foundation, the Mental Health League, and religious organizations that provide coverage to approximately 2% of the population and for-profit institutions and agencies, such as hospitals, convalescent homes, private clinics and offices, and the private universities' schools of medicine and dentistry.

Of the country's 59 private hospitals, about two-thirds are located in Guatemala City. There are 479 nongovernmental organizations that conduct health activities (1988).

Infrastructure development aims at the decentralization/deconcentration of the Ministry of Public Health and the adjustment of its organizational structure according to managerial and regionalization demands, the promotion of local health systems, and the strengthening of managerial capability. The IGSS has followed the same approach by including promotion and prevention activities, by extending coverage to new groups of workers based on the primary care strategy, and by pursuing a rational division of labor at the local level with the Ministry.

A system of urban and rural development councils, established in 1987, consists of a national council and regional, departmental, municipal, and local councils. This system facilitates social and sectoral participation in local economic and social development projects.

Production of Services

In 1987, consultations at the health centers and health posts totaled 2,559,050 (an average of 16 consultations for every 100 inhabitants), of which 61.4% were first consultations. All first consultations occurred in the three programs of direct care for patients: the pediatrics program, 50%; the maternal program, 12%; and the general program, 38%. Physicians attended half of first consultations, nurses covered approximately 8%, and nursing auxiliaries, the remaining 42%.

In 1988, the country's hospitals offered 730,103 scheduled consultations and 478,096 emergency consultations. Between 1985 and 1987 there were some 220,000 discharges per year. In 1987, 22% of discharges corresponded to general medicine; 16.9%, to surgery; 17.7%, to pediatrics; 38.6%, to obstetrics and gynecology; and the remaining 4.8%, to chronic and other causes. The rate of hospital bed occupancy was 55%, average hospital stays were six days, and bed turnover was 35.8 patients per bed. The average daily cost per occupied bed was Q36.74 (Q2.72 = \$US1 in 1987).

Installed Capacity

There are 216 health posts, 184 type B health centers (without beds), 32 type A health centers (with beds), and a total of 35 district, area, regional, and national hospitals. These facilities are organized into 24 health areas, which, in turn, form eight regions.

The 35 Ministry of Public Health hospitals have a total of 8,035 beds, 42% of which are in the Department of Guatemala. In addition, there are 306 beds in the type A centers (68%). In 1986 the Social Security Institute had 2,332 beds in 75 establishments. The Armed Forces had 500 beds and the private sector (which has recently expanded), some 2,500 beds.

Health Services Technologies

Biomedical equipment in the health facilities is not adequately maintained; the diversity of brands makes it difficult and costly to manage this equipment, especially in terms of getting replacement parts. The services lack personnel adequately trained in maintenance. Apart from the hospitals, type B health centers have the largest share of x-ray diagnostic equipment for dentistry (26%). Hospitals and type B centers account for 90% of all basic laboratory equipment, and this equipment is distributed about equally in both types of institutions.

There are 1,380 pharmacies in the country, 53 of which are state-owned, and come under the responsibility of the Ministry of Public Health. The national pharmaceutical industry produces a wide range of drugs using imported raw materials. Exports of finished drugs and raw materials amounted to \$US48 million in 1988, and imports, to \$US68 million. Drug expenditures in 1986 were estimated at \$US13.60 per capita. The country depends heavily on imports for vaccines, reagents, and other critical supplies. As of March 1989, 8,945 pharmaceutical products were registered.

Financing of the Health Services

The Ministry of Public Health budget increased from Q96.7 million to Q290.7 million during 1985-1988. The amount allocated to investment rose from Q16.1 million to Q83.7 million during the same period. Ten percent of the country's annual budgetary resources go to the health and social welfare sector.

The internal distribution of sectoral spending has remained unchanged. The Ministry received 56% and the IGSS, 33%; the rest was earmarked for other public or private institutions. In 1975 the Ministry's budgetary allocation was equivalent to an annual per capita expenditure of Q5.81; in 1980 this figure was Q15.72; in 1985, Q11.61; and in 1988, Q30.05.

Health Planning and Administration

Since mid-1987, data have been collected and processed on hospital production, performance, and cost. The next stage will involve data collection on health centers and health posts. The development of managerial capability at the central, regional, and area levels will include training for the analysis and optimum utilization of data.

National policies and plans for economic and social development provide a framework and general direction for public administration and for the activities in the production sector. However, the planning process in the Ministry of Public Health is not effective enough yet to implement these policies.

Human Resources

The health labor force (13,139) includes all employees in the two major public sector institutions. Of these, 19% are university-trained professionals, 28% are technical personnel without university training, and 53% are auxiliary personnel. Personnel availability is explained as follows:

- The Ministry's budgetary resources dictate a greater absorption of personnel in those categories that require less schooling and, thus, pay lower wages.
- The private sector, which uses primarily professional personnel, has not been taken into account.
- In order to enter a nursing school, an applicant must first have completed intermediate-level schooling and have had three years of upper-level studies. The school run by the Ministry of Public Health has not been officially recognized at the university level.

A university professional receives a salary of Q1,000 to Q1,500 per month in the Ministry of Public Health, and from Q1,200 to Q1,320 in the IGSS. A technical worker earns from Q330 to Q720 at the Ministry and from Q495 to Q575 at the IGSS, and auxiliary personnel receive a minimum salary of Q330 and a maximum of Q365 in the Ministry (1988).

If the situation in the Ministry of Public Health as of 1988 is compared with the situation in 1984, it can be seen that there was a major increase in university-trained professional personnel (15.5%) and auxiliary personnel (11.5%). An analysis of the health manpower supply by institution vis-à-vis the population to be covered reveals a major disparity between the Ministry and the IGSS.

The IGSS has a ratio of 32.0 health staff per 10,000 users, while the Ministry has only 14.3 per 10,000. At the IGSS there is a ratio of 9 university-trained professional staff per 10,000 users, and at the Ministry only 2.4. Thus the ratio at the Social Security Institute is almost triple that of the Ministry for this category of personnel. The situation is similar for technical personnel and auxiliaries.

The population covered by the Ministry is much larger than that covered by the IGSS (77% and 13% of the national population, respectively). This disparity partly explains the lack of equity in the distribution of the work force in the health sector, and thus of health care. This is not to say that the IGSS is overstaffed; rather, what is obvious is the deficient financing of the Ministry as compared with the Institute's.

The difference in the manpower structure in the two institutions reflects the different approaches to organizing the health care and services provided. The Ministry has some personnel who work directly in prevention, such as rural health technicians and sanitary inspectors.

Some personnel categories (sanitary engineer, nutritionist, and technical personnel in general) are too scarce to meet health care needs in the public sector.

A study of the geographical distribution of the health work force shows a greater concentration of personnel in the Department of Guatemala (1.07 employees for each employee in the other departments), which is mainly due to the greater concentration of professional staff (a ratio of 1.85:1). The technical and auxiliary personnel are concentrated to a greater degree in the rest of the departments. Of the professional categories, only physicians (817) and dentists (82) are significantly represented in the interior, where 79% of the country's population resides. Of the work force in the interior, 56.4% is made up of auxiliary personnel, and slightly more than 14% of university-trained professional staff. Half of the auxiliary personnel labor force has to cover 79% of the population.

Of the total health work force, 64% is female. Although women represent the majority in the public health sector,

they work mostly in auxiliary and technical categories; only 40% are university-trained professionals. The opposite pattern prevails for males in the work force.

Most personnel are located at the hospital centers in urban areas. This occurs because the budget allocated to preventive care facilities is considerably lower than that allocated to the hospitals, and even the latter is inadequate. This situation widens the gap between the population's health conditions and the system's response.

The Ministry of Health has had to train midlevel technical personnel to cover its own service needs, such as rural health technicians, environmental sanitation inspectors, physiotherapists, radiology technicians, and laboratory technicians.

The nursing work force numbers 9,619 (9,550 in-service and 69 teaching nurses). Most of these, 6,149 (64%), work with the Ministry of Public Health, followed by the IGSS with 2,116 (22%), the Armed Forces with 291 (3%), and private and other institutions with 1,063 (11%) (Table 1).

In the service area, the largest concentration of nursing personnel is in the Department of Guatemala, which has 48% of the total; the other departments have percentages ranging from 5.5% in Quetzaltenango to 0.9% in El Progreso. Of all nurses, 92.2% work in urban areas and 7.8% in the countryside. Of the personnel in rural areas, 92% are Ministry of Health employees.

There are three three-year nursing schools and five permanent schools for training nursing auxiliaries in eight-to-ten-month courses. All these educational establishments come under the responsibility of the Ministry of Public Health. There are 69 teaching nurses: 44 teach in

| Institution | Total | Nurses | Auxiliaries |
|---|-------|--------|-------------|
| National total | 9,619 | 1,467 | 8,152 |
| Ministry of Public Health and Social Welfare ^a | 6,149 | 918 | 5,231 |
| In service | 6,080 | 849 | 5,231 |
| Educators | 69 | 69 | — |
| IGSS ^a | 2,116 | 376 | 1,740 |
| Armed Forces ^b | 291 | 55 | 236 |
| Private ^b | 995 | 114 | 881 |
| Other ^b | 68 | 4 | 64 |

Sources: ^a Department of Research, Division of Human Resources, Ministry of Public Health and Social Welfare. Composition and Occupation of the Work Force in the Health Sector, 1988.

^b Ministry and PAHO/WHO. Study on the situation of nursing in Guatemala, March 1987.

nursing schools and 25 teach in schools for auxiliaries. In the nursing schools there were 2,146 admissions and 1,298 graduates over an 11-year period (1975–1985), with annual averages of 195 admissions and 118 graduates. In the schools for training auxiliaries there were 3,472 admissions and 2,815 graduates during the same period, with annual averages of 316 admissions and 256 graduates.

HEALTH AND THE ENVIRONMENT

By the end of 1987, coverage of drinking water and sanitation services (excreta and wastewater disposal) for the total population of 8,434,339 inhabitants in late 1987 was 58% and 54%, respectively. In urban areas (3,185,528 inhabitants) drinking water services reached 87.1% of the population and sanitation services, 72.5%; in rural areas (5,248,811 inhabitants), these figures were 41% and 47.7%, respectively.

According to the National Plan for the International Drinking Water Supply and Sanitation Decade, the proposed coverage goals for 1990 are 73.2% for both drinking water and sanitation. These will be difficult to achieve, since between 1982 and 1988 increases were only 4.4% and 10%, respectively.

Provision of these services in rural areas is primarily under the responsibility of the Ministry of Public Health, and in urban areas, of the municipal governments. It is estimated that approximately 85% of the urban systems supply water that has some degree of contamination resulting from lack of protection of water sources and deficient treatment. The rural water supply systems are also beset by quality problems.

Domestic and industrial wastewater is not treated at all; it is dumped into rivers and other bodies of water, leading to serious water pollution.

The collection, transportation, and final disposal of solid waste are the responsibilities of the municipalities, but few are organized to provide this service; all final disposal is in open-cut dumps, which can be found in or close to urban centers (as in Guatemala City, where some 1,000 tons of refuse are generated daily) and on uncultivated lands, which then become breeding grounds for flies, rats, and other vectors.

Environmental pollution is already a problem, especially in the capital. The Guatemala City metropolitan area is home to approximately 25% of the national population and 70% of the industries, most of which involve food-processing.

All watersheds are polluted, and it is estimated that the total BOD (biochemical oxygen demand) comes to 128,802 kg/day, primarily due to disposal of untreated wastewater and excreta. The greatest share (63.6%) is

dumped into the basin of the Motagua river, followed by the rivers in the southern part of the valley, which receive 18.8% of the total discharge. This discharge also reaches Lake Amatitlán, which is now showing the effects of eutrophication. Water pollution from agricultural chemicals (fertilizers and pesticides) and from industrial waste (which has not been quantified), as well as high levels of fecal and chemical discharges, poses major threats to human health. Furthermore, polluted river waters are used to irrigate all types of agricultural products for human consumption.

Soil contamination is mainly due to open-air disposal of excreta, especially in rural areas, where it is estimated that only 46% of the population have latrines. Most municipalities do not have organized systems for public trash removal, which means that refuse is dumped in open-cut spillways; rural dwellers leave their trash on uncultivated lands.

Pesticides also contaminate the soil, from which they drain into and pollute waterways. There is no control over the quantity or quality of pesticides used. It is estimated that 10,020 tons of these chemical products, as well as 171,680 tons of fertilizer, are used annually in the country.

Guatemala City already faces a serious air pollution problem, due mainly to automobile emissions; cars account for 60% of all the country's vehicles. Emissions from diesel engines and tetraethyl lead, which is used as an additive to increase the octane grade of gasoline, are Guatemala City's two principal air pollutants. Studies on the pollution caused by urban mass transport and by private automobiles indicate that suspended particulate matter, settled particulates, sulfur dioxide, and lead have exceeded WHO reference levels, with maximum values of 250 $\mu\text{g}/\text{m}^3$, 244 mg/cm^2 , 260 $\mu\text{g}/\text{m}^3$, and 35 $\mu\text{g}/\text{m}^3$, respectively. Adequate measures to resolve this problem have yet to be taken.

As mentioned before, 70% of all industrial establishments are located in Guatemala City, which makes industry an important air pollution source. Air pollution control comes under the responsibility of the Municipality of Guatemala City, the Ministry of Public Health, and the National Police (automobiles), but there are no programs for carrying it out. In general, environmental protection and improvement is a function of the National Commission on the Environment, which comes under the Presidency of the Republic. It was created by the Law for Environmental Protection and Improvement enacted in December 1986. However, since regulations have not been drawn up, the law's enforcement is hindered.

There are no environmental assessments to serve as a reference for determining the extent of noise pollution, nor are there any regulations or programs for designing and carrying out organized actions.

Food safety is a responsibility shared by the Ministry of Public Health and Social Welfare; the Ministry of Agriculture, Livestock, and Food; and the municipalities, each acting in its respective sphere. Quality control of food sold to consumers is done through inspection and in laboratories. Inspection is conducted systematically in the capital and sporadically in the departments. There is no register of food sales, but it is estimated that in the capital 60% of the establishments are inspected yearly. In 1988, 1,100 samples were analyzed for sanitary registration and 4,000 samples for food control in general: 15% of the former samples and 40% of the latter were rejected because they did not meet the standards. To improve this situation, a follow-up, including technical advisory services, is being carried out.

Microbiological control is given special importance, since food-handling hygiene leaves much to be desired. Educational campaigns directed at food handlers are currently under way.

Milk quality received special attention in 1988, but there are no official data to quantify the existing problems. Pesticides, such as organophosphorous insecticides and dithiocarbamate fungicides, are controlled, especially in vegetable crops, where high levels can occasionally be found.

After an outbreak in 1987 of paralytic intoxication caused by shellfish, known as "red tide," control of saxitoxins in bivalves is done routinely. For exported food products, analyses required by importing countries are conducted.

GUYANA

GENERAL CONTEXT

Political, Economic, and Social Situation

Guyana gained its independence from Great Britain in 1966 and became a cooperative republic within the British Commonwealth in 1970. The 1980 constitution, which reflects the Government's socialist philosophy and policy of nonalignment, established the National Congress of Local Democratic Organs, the Parliament, and the Supreme Congress of the People as the central deliberative bodies; the Presidency and the Cabinet are the supreme executive organs. The country's 83,000 square miles are divided into ten administrative regions, and each region is administered by a regional democratic council headed by a chairman.

Natural resources include forests, gold, diamonds, and bauxite. The economy is based on the production and export of sugar, rice, and bauxite. The export of other products such as timber, fish, shrimp, fruits, and vegetables is being vigorously pursued in an attempt to diversify the country's economic base.

Centralized economic planning is under the direction of a State Planning Secretariat. The economy experienced real growth of less than 1% in 1986 and 1987, and this rate dropped to -3% in 1988. In 1988 the gross domestic product (GDP) was about \$US28,570,000, and was distributed as follows: agriculture and mining, 44.2%; manufacturing and construction, 13.4%; and services, 42.3%. The economy has been adversely affected by below normal production of critical exports such as sugar and bauxite, and there is a chronic shortage of foreign exchange. Inflation is estimated at more than 25% per annum. An economic recovery program is being developed.

The official rate of exchange introduced in April 1989 (G\$33 = \$US1) represented an increase of more than 230% over the previous rate; this devaluation was accompanied by a 20% increase in wages paid in the public sector.

Affordable, low-cost housing is not readily available, especially in urban areas. Most of the coastline experiences severe flooding whenever there is heavy rainfall, creating potential health hazards.

Literacy remains relatively high at 81%. Of a total

217,955 students in the educational system in 1986-1987, 11.6% were enrolled at the nursery-school level, 61.8% at the primary-school level, 23.5% at the secondary-school level, 1.9% in technical/vocational schools, and 1.2% at the tertiary level.

The coastal regions are served by a system of hard-surface roads that run for approximately 450 miles along the coast and along the east and west banks of the Demerara and Berbice Rivers; about 1,500 miles of unpaved roads and trails lead to interior locations. The interior is linked to most of the major areas mainly by air, but service is unreliable and costly.

Demographic Characteristics

In 1986, the country's population was estimated at 756,072, with an almost equal proportion of males and females; 83% of the population lives on the coastal plain and the remaining 17% is scattered in the interior's small towns, villages, and settlements. Thirty-six percent of the population lives in urban areas, 70% of which resides in the capital, Georgetown. In 1985, women of childbearing age (15-44 years) represented 23% of the population, children under 5 years of age, 13%; children between 5-14 years, 28%; and those over 60 years, 6%, leading to a high dependency ratio.

The population consists of East Indians, Negroes, Chinese, Amerindian, whites, and various mixtures. East Indians and Negroes together make up more than 80% of the population. The annual population growth rate has declined steadily since 1960, from 3.25% in 1960 to 0.78% in 1986. A high level of emigration and a decline in the crude birth rate are the main factors responsible. The crude birth rate was estimated at 23.8 per 1,000 population in 1986, having steadily declined since 1970 when it was 33.7 per 1,000.

The crude death rate increased from 6.8 to 7.9 per 1,000 population between 1970-1986. Male mortality has been consistently higher than female mortality, with a difference of 767 deaths in 1984 (2,774 male deaths and 2,007 female deaths). Life expectancy at birth has increased steadily over the last 40 years, to a level of 65.8 years for males and 70.8 years for females in 1986. The total fertility rate in 1986 was 2.8 children per woman.

Discrepancies between reported net migration and ap-

parent net migration have resulted in a difference between official and nonofficial population figures, the rates of population growth and the derived intercensus population estimates. Emigration represents a significant drain on the younger and more educated sector of the population. This process will undoubtedly have some long-term effect on the population structure.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality

National statistical data show that cerebrovascular diseases were the second leading cause of death reported for all ages combined in 1979 and the first in 1984, when it caused 13.1% of deaths, excluding those classified as ill-defined. The category "diseases of other parts of the digestive system" ranked second in 1984, but in that year intestinal infectious diseases were included in the cause group, whereas they were reported separately in 1979. "Other noninfective gastroenteritis and colitis" caused 45.8% of the 559 deaths assigned to this cause group in 1984. Diseases of pulmonary circulation and other forms of heart disease ranked third in 1984, with 421 deaths (9.9% of deaths, excluding those classified as ill-defined) (Table 1). Deaths due to symptoms and ill-defined conditions represented 13.2% of total deaths in 1979 and 10.8% in 1984.

Health Status of Specific Population Groups

Child Health

The incidence of low birthweight during 1982 and 1984 was 18.4% and 19.5% of births, respectively. A survey conducted in 1986, found that the incidence of live births of weight lower than 2,500 g was 20.7% among East Indians and 20.3% among Negroes. Low hemoglobin levels in pregnancy may be related to low birthweight, although inadequate antenatal care is frequently seen as the causal factor.

During 1984–1985, approximately 10% of all births were handled by domiciliary midwife services. The prematurity rate in 1986 and 1987 was 4.7% and 3.3%, respectively, which is higher than it was during 1984–1985. The stillbirth rate also was high (10.8 per 1,000 births in 1987). Although the trend declined compared to that in 1984, when it was 11.8 per 1,000 births, the rate in 1987 was higher than in 1985 (10.2 per 1,000 births) and 1986 (7.2 per 1,000 births).

TABLE 1

Leading causes of death and rates per 100,000 population, Guyana, 1984 and 1979.

| Causes of death (in 1984 rank order) | 1984 | | 1979 | |
|--|------|------|------|------|
| | Rank | Rate | Rank | Rate |
| Cerebrovascular diseases (430–438) | 1 | 76.2 | 2 | 65.2 |
| Diseases of other parts of the digestive system (530–579) ^a | 2 | 70.9 | 7 | 30.5 |
| Diseases of pulmonary circulation and other forms of heart disease (415–429) | 3 | 53.9 | 1 | 88.9 |
| Other diseases of the respiratory system (466, 480–519) | 4 | 37.1 | 3 | 54.2 |
| Ischemic heart disease (410–414) | 5 | 33.1 | 4 | 41.0 |
| Endocrine and metabolic diseases, immunity disorders (240–259, 270–279) | 6 | 33.2 | 8 | 25.7 |
| Nutritional deficiencies (260–269) | 7 | 31.8 | 7 | 14.1 |
| Other violence (E970–E999) | 8 | 23.4 | — | ... |
| Intestinal infectious diseases (001–009) | — | ... | 5 | 39.5 |
| Certain conditions originating in the perinatal period (760–779) | — | ... | 6 | 39.2 |
| Symptoms and ill-defined conditions (780–799) | — | 65.7 | — | 89.0 |

^aIn 1984, this cause group included intestinal infectious diseases (001–009), reported separately in 1979.

Source: Ministry of Health. Statistical Unit.

In 1985, approximately 51% of all known births in Guyana were delivered at Georgetown Hospital; in 1984–1987, 91.4% of births were normal deliveries and 6.0% were by cesarean section. The prematurity rate was about 5% of live births; the stillbirth rate was high, with an average of 20 per 1,000 births; and the neonatal mortality rate also was high, with a peak of 31.1 deaths per 1,000 live births in 1986.

Stillbirth rates from both domiciliary midwife services and the hospital were high, and suggest a high perinatal mortality rate. The above-mentioned 1986 survey reported a combined hospital and home delivery stillbirth rate of 23 per 1,000 births.

Table 2 shows the crude death rate, the infant mortality rate, and the mortality rate in children 1–4 years old for

| Rate (per 1,000) ^a | 1979 | 1984 | 1986 |
|--------------------------------|------|------|------|
| Crude death rate | 7.1 | 7.6 | 8.0 |
| Infant mortality | 33.5 | 45.0 | 49.0 |
| Mortality rate 1 to 4 years | 2.7 | 3.4 | 4.4 |

^aInfant mortality rate per 1,000 live births.
Source: Ministry of Health. Statistical Unit.

the years 1979, 1984, and 1986. Increases were observed in all those rates during the period.

In 1984, the latest year for which data are available, there were 549 deaths among children under 1 year. Nutritional deficiencies, the leading cause of death, were responsible for 23.8% of infant deaths, excluding deaths from ill-defined causes; in 1979 nutritional deficiencies ranked fourth. "Diseases of other parts of the digestive system" were the second leading cause, with 18.1% of deaths, excluding deaths from ill-defined causes. Certain conditions originating in the perinatal period ranked third, with 12.3%. This was the leading cause of infant mortality in 1979, causing 25.0% of all deaths, excluding deaths from ill-defined causes. The number of deaths due to symptoms and ill-defined conditions was 29 (5.3%) in 1984, down from 82 (11.1%) in 1979.

In 1984, the leading causes of death, in descending order, among 1–4-year-olds were "diseases of other parts of the digestive system" (33% of deaths, excluding those from ill-defined causes), nutritional deficiencies (18% of deaths, excluding those from ill-defined causes), and other diseases of the respiratory system (8%, excluding those from ill-defined causes). There were a total of 201 deaths in this age group.

Although data are incomplete, acute diarrheal disease and acute respiratory diseases remain the leading causes of childhood morbidity in the country. With the exception of gastroenteritis and malaria, there is no available information on the incidence of diseases by age group. More than 90% of all reported cases of gastroenteritis from 1984–1988 occurred among children under 5 years old.

At Georgetown Hospital's pediatric wards, gastroenteritis accounted for an average of 29.1% of total admissions in 1984–1988, with decreases in 1987 (23.5%) and 1988 (22.5%). Gastroenteritis accounted for 39.2% of deaths in the pediatric unit, with a case fatality rate of 22%.

Health statistics show an increase in pneumonia and influenza cases reported in 1985–1987. During 1987,

there were 254 reported pneumonia cases among the 0–5 age group.

From October 1987 to February 1988, there was an acute measles outbreak in the interior regions. The outbreak registered a significant mortality, distributed in the 0–20 age group, and many cases were complicated by pneumonia, probably because medical attention was sought very late. About 500 measles cases were officially identified nationwide, and there were 43 reported deaths. This outbreak occurred due to low immunization coverage of the susceptible population.

In February 1989, an outbreak of whooping cough in Region I (Barima-Waini) registered 131 known cases but no reported deaths. This outbreak was caused by lack of cold chain equipment, which led to inadequate immunization coverage.

An oral health survey of schoolchildren was carried out in 1982. The survey results, as reported by the Chief Dental Officer, indicated that the prevalence of dental caries, as identified with WHO standards, was high among 6-year-olds but lower among 12-year-olds.

During 1983–1986 an average 57.0% of children up to 5 years of age attending clinics were in the normal grade according to the Gomez classification for malnutrition, although the percentage was slightly higher in 1986 (59.5%). During 1985 and 1986 figures for Grade I had decreased to 32.4% and 30.1%, respectively, but Grade II (9.1%) and Grade III (1.3%) remained high.

In 1986 the differences in nutritional status between the first and second year of life were notable for all grades of nutritional classification (Table 3). For that year, the number of children in the normal grade was 32% lower in the 12–23-month age group than in the 0–11-month age group.

In 1987, a nutritional survey under the direction of the Caribbean Food and Nutrition Institute (CFNI) was carried out in all the regions. The clinical records of some 36,095 children under 5 years of age were reviewed, which represented almost 60% of the total population in

| Classification | Under 1 year | 1–2 years |
|----------------|--------------|-----------|
| Normal | 76.4 | 44.3 |
| Grade I | 18.4 | 41.7 |
| Grade II | 4.3 | 12.1 |
| Grade III | 0.9 | 1.9 |

Source: Ministry of Health. Maternal and Child Health Department.

that age group. According to the Caribbean Growth Chart, it was found that around 23% of those children were malnourished, with Regions VI and X having the highest levels.

Of the 37,000 schoolchildren screened in 1984–1986, more than 25% had some health problem. In 1984 and 1986 an average of 9% were diagnosed as “children with pallor,” suggesting anemia, and in 1985 and 1986 there was a high incidence of children with dental problems (15.4% and 20.6%, respectively).

The percentages of children under 1 year (based on estimated population) fully immunized against tuberculosis, diphtheria, whooping cough, tetanus, polio, and measles for 1984–1988 are shown in Table 4. Coverage levels for all vaccines during the period were lower than the Expanded Program on Immunization goal.

TABLE 4

Percentage of children under 1 year fully immunized, by type of vaccine, Guyana, 1984–1988.

| Vaccine | 1984 | 1985 | 1986 | 1987 | 1988 |
|---------|------|------|------|------|------|
| BCG | — | — | 75.5 | 68.6 | 64.0 |
| DPT | 69.8 | 75.0 | 63.7 | 67.0 | 64.3 |
| OPV | 66.8 | 77.2 | 67.0 | 76.7 | 69.4 |
| Measles | 56.0 | 39.5 | 42.2 | 52.2 | 55.2 |

Source: Ministry of Health, Maternal and Child Health Department.

Different regions achieved different levels of immunization coverage in this period, with Regions VII, VIII, and IX having the lowest immunization levels for all diseases. The main problems were inappropriate cold chain facilities and inaccessibility of the communities, but lack of adequate supervision at the regional level and lack of social communication activities also were factors. The surveillance system in the country needs overall improvement.

The main causes for drop-out rates in the interior include parents who lack information about vaccinations offered; long distances for parents to travel with children; vaccination teams that do not arrive when scheduled; and fear of vaccine side effects.

A new four-year EPI project was started in April 1988 with defined areas of action, objectives, activities, and expected outcomes. This project is jointly sponsored by the Canadian International Development Agency (CIDA), PAHO, UNICEF, Rotary International, and the Ministry of Health.

Health of Adolescents and Adults

The information on mortality in this population group indicates that trauma is one of the most common causes of death. Automobile accidents account for a large percentage of deaths in this age group.

Cardiovascular diseases continue to be the leading cause of death in Guyana; however, myocardial infarction is not the most important cause among them. According to the most recent data on mortality rates (Ministry of Health, July 1988), the number of patients suffering from diabetes and hypertension has not increased over the past years.

Sexually transmitted diseases seem to have increased, although it is not possible to confirm this because data are unavailable.

Maternal health services continue to reveal several problems, a major concern being anemia during pregnancy. Statistics from health centers showed that in 1987, 70.5% of women checked had a hemoglobin level below 11 g/100 ml. In 1985, a lower percentage of pregnant women (56.6%) had hemoglobin levels lower than 11 g/100 ml.

A sample survey of antenatal and child health clinic records in 1986 reflected that 5.4% of pregnant women had hemoglobin levels lower than 8 g/100 ml (severe anemia), 25.5% were between 8 g/100 ml–10 g/100 ml (moderate anemia), and 27.5% were between 10 g/100 ml–11 g/100 ml (mild anemia). Similar findings were reported in a 1985 survey done by the Ministry of Health. Both surveys also found that the lowest hemoglobin levels were more prevalent in the third trimester of pregnancy. Some follow-up studies found that iron deficiency was the major factor contributing to anemia.

In 1987, only 33% of mothers attended antenatal clinics before 22 weeks of gestation, showing that, despite education programs, the community lacks awareness about pregnancy and there is poor promotion at the health center level. The number of teenage pregnancies is a matter of concern.

The maternal mortality rate was 0.4 per 1,000 births in 1979 and 0.6 in 1984; no subsequent national figures are available. Maternal mortality at Georgetown Hospital increased to 2.7 per 1,000 births in 1985 and decreased to 1.7 per 1,000 births in 1987. The major causes of maternal mortality are toxemia during pregnancy, hemorrhage, and sepsis of childbirth during the puerperium.

An average of 7,874 occupational accidents were reported annually for 1985–1986, a decrease from the 9,150 reported in the previous period but still an alarming figure considering the country's small population. The sugar industry was the most affected, with a rate of 95%; the bauxite industry had 4.7%.

Health of the Elderly

The most important disorders in this age group are cardiovascular diseases, more frequent when hypertension and/or diabetes are present. They are the result of widespread atherosclerosis, which leads to heart attacks, strokes, and mental impairment. Gangrene of lower limbs and other manifestations of ischemia resulting from peripheral arterial diseases are also prevalent. Hypertension, diabetes, arthritides, and musculoskeletal problems also were commonly seen. Chronic disability is another frequent problem, and among its leading causes are strokes and blindness. Severe visual impairment is a major problem and cataracts remain its number one cause.

Ambulatory care and acute hospital services are provided by the regional system of health care and at The Palms Hospital, an institution which also provides general outpatient services for all age groups. There are 18 residential homes that generally cater to elderly who are reasonably well and can care for themselves; no on-site medical services are provided in these homes.

Problems Affecting the General Population

From 1985 to 1987, malaria was the most prevalent infectious parasitic disease, with malaria caused by *P. falciparum* spreading in epidemic fashion throughout the western part of the country. Although coastal areas had been practically free of malaria since the 1950s, the exacerbation of the disease in the interior and increasing population movements between the two areas have resulted in the detection of locally imported malaria cases along the coast. Given this, and if conditions become suitable for transmission along the coast, malaria will once again spread to this populated area of the country unless effective control measures are adopted in the endemic areas.

Malaria cases rose from 3,006 in 1984 to 35,451 in 1988, the equivalent of a morbidity rate of 4,510 per 100,000. *P. falciparum* was the predominant species in more than 65% of the cases. Indiscriminate use of anti-malarial drugs in endemic areas could increase the already evident drug resistance of *P. falciparum*. *Anopheles darlingi* is the principal vector of malaria throughout the endemic areas.

Bancroftian filariasis is a serious public health problem, especially in the capital city, where the main vector responsible for its transmission, *Culex quinquefasciatus*, is present in high densities.

Although only occasional cases of jungle yellow fever have been reported in the country, high densities of *Aedes aegypti* in urban areas are a source of concern. As this mosquito is also responsible for the spread of dengue fever in other countries of the Caribbean and Central and

South America, an epidemic could result if infected cases are introduced in the country.

Cases of cutaneous leishmaniasis and Chagas' disease continued to be documented over the last few years, but information about the spread and significance of these infections in the interior is still incomplete.

The leprosy program, partially funded by the Dutch Leprosy Relief Association, continued to progress. The number of leprosy patients registered for chemotherapy decreased since 1982; by 1986, 152 patients were registered for specific ambulatory treatment.

Although there was a suspected AIDS case at the end of 1982, the first case was not officially reported until 1987. The cumulative number of HIV infected persons up to February 1989 was 50, including five females. Twenty-six of these infected individuals developed characteristic signs and symptoms of AIDS and twenty-five died, including the five females. Twenty-four males also were classified in category II of the clinical spectrum of HIV infection (asymptomatic) by February 1989. The highest prevalence is among homosexuals/bisexuals and in the 25-29 age group. This is almost certainly an underestimate of the true magnitude of the problem, given the underdetection of AIDS cases and the lack of assessment of HIV seroprevalence in different population groups.

In mid-1987, a national AIDS committee was appointed by the Ministry of Health and a national short-term plan for prevention and control of AIDS was prepared; the plan focused mainly on information and education activities and on strengthening the infrastructure for follow-up and treatment of sexually transmitted diseases. A European Economic Community (EEC) three-year project is also providing equipment and supplies to improve blood transfusion services, including the creation of a national laboratory to detect HIV infections in blood donors and support epidemiological and clinical assessments.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems and Installed Capacity

The Ministry of Health is responsible for establishing national health standards and for protecting the health of and providing health services to all nationals. It monitors health standards, establishes health policies, develops and implements health plans and programs, monitors the quality of food and drugs, monitors the provision of safe drinking water, and formulates bylaws and regulations on all public health issues. In 1987, an agency for health sciences education, environment, and food policy

was established to formulate policies and plans in these areas and, with the approval of the appropriate Minister, to implement those policies and plans.

The Guyana health system is composed mainly of public sector institutions, although private hospitals and medical practitioners play an important role. In each region there is a regional democratic council supported by district and neighborhood councils. The local democratic organs are responsible for managing the health services within the region, with the Ministry of Health playing a coordinating role.

The health services are divided into five levels of care. Level I consists of a health post, staffed by a community health worker, which functions at the grass-roots community level. There are 65 Level I health posts located in six of the ten regions. Level II care is provided through 104 health centers distributed among the ten regions and Georgetown and staffed by medex (medical assistants), health visitors, midwives, environmental health officers, and assistant nurses. Level III care rests in district hospitals which exist in eight of the regions. Level IV care is provided by regional hospitals which exist in four of the regions and offer medical, surgical, obstetric, and pediatric services. Level V care consists of the national referral hospital in Georgetown and three specialty hospitals (psychiatry, children, and indigent/elderly). Six of the seven private hospitals in Guyana are located in Georgetown.

The national health system's broad policies and objectives include: reduction of mortality and morbidity rates (especially maternal and child mortality); reorganization of the health services administrative structure and system; improvement of the health planning and programming process; development of human resources; improvement of the population's nutritional status; improvement of dental health services; establishment of effective vector control programs (particularly malaria); improvement of environmental health services; strengthening of public health education services; and improvement and expansion of diagnostic, treatment, and rehabilitation services and facilities.

Services Production and Technologies

In 1985, outpatient visits per inhabitant per year ranged from 0.3 in Regions V and X to 3.6 in Region VII. Studies have shown that many patients from Regions III and IV bypass local institutions and come directly to Georgetown Hospital, suggesting that patients prefer this facility's specialized services and access to drugs and medical supplies.

Hospital admissions for the entire country are around

70,000 per year; between 40% and 45% are to Georgetown Hospital.

Main laboratory services are provided at Georgetown Hospital, with similar limited services available at hospitals in the regions. The Government has established a blood bank service with facilities for HIV testing. In recent years Guyana has experienced an acute shortage of drugs resulting from scarcity of foreign exchange. However, in 1988 the Guyana Pharmaceutical Corporation completed and commissioned a new plant to increase its current limited production of drugs and to reduce the need for foreign exchange to purchase these items.

Financing of the Health Services

Public health sector funds are provided from general revenues, donations, and loans. The national policy is to provide health care free of charge. However, there is a small charge for outpatient prescriptions and dental services, a fee that is waived for children, pregnant women, and pensioners. Private inpatient services are also available at Georgetown Hospital. Because of severe budgetary restrictions, public health sector expenditures in recent years have been largely for recurrent costs (96% of the total budget in 1986 and 1987). Capital expenditure is usually limited to urgent repairs. Allocations for recurrent costs in the public sector were \$G99.3 million in 1986 and \$G137.4 million in 1987, an increase of 38.4%. The health budget represented 6.75% (1986) and 6.5% (1987) of the total Government's budget. Capital expenditures for the health sector were \$G4.1 million in 1986 and \$G5.7 million in 1987. During 1985–1988 personnel costs have absorbed 54% of recurrent expenditures for hospitals and health centers. This is to be expected considering the restrictions on salaries and the high cost of imported supplies and equipment.

Human Resources

There is a serious shortage of human resources in the public health sector (Table 5). This situation is likely to continue, given the emigration of health professionals and the public health sector's inability to attract and retain health professionals. Ninety percent of physicians are in the public health sector, as most medical and other health professionals in the private sector are also employees of the public sector. The Government has taken action on many fronts to solve this problem, including the establishment of a medical school and the strengthening of health programs offered at the Faculty of Health Sciences of the University of Guyana.

TABLE 5

Number of health personnel and ratio per 10,000 population, Guyana, 1987.

| Health personnel | Total | Ratio |
|-------------------------------|-------|-------|
| Physicians | 164 | 2.0 |
| Dentists | 16 | 0.2 |
| Nurses | 789 | 9.8 |
| Midwives | 409 | 5.1 |
| Nursing assistants | 875 | 10.9 |
| Dental nurse/aides | 37 | 0.5 |
| Medexes | 126 | 1.6 |
| Medical technologists | 49 | 0.6 |
| Radiographers and technicians | 17 | 0.2 |
| Pharmacists | 38 | 0.5 |
| Dispensary assistants | 46 | 0.6 |
| Public health inspectors | 58 | 0.7 |
| Hospital administrators | 3 | 0.04 |
| Statistical clerks | 15 | 0.2 |
| Other staff | 165 | 2.1 |

HEALTH AND THE ENVIRONMENT

Since 1981, the environmental health sector infrastructure in Guyana has seriously deteriorated, and remedial efforts have not been able to keep pace with the deterioration. Consequently, water supply and sanitation services, solid waste collection and disposal, food sanitation, drainage, and other services have reached a critical condition, and diseases such as typhoid, hepatitis, gastroenteritis, and malaria have become endemic. During the past ten years, there has been no substantial investment for rehabilitating those vital infrastructures, except in Georgetown where a sewer rehabilitation program was carried out under an EEC grant.

Regarding institutional development, the newly created agency for health sciences education, environment, and food policy has sparked new dynamism in the development of the environmental health sector.

In 1984, all the rural water supply schemes were transferred to the regional administrations. Since then, the Guyana Water Authority has functioned as a national planning, design, and construction agency for water system development, with responsibility to provide consultation and repair services as required. The scarcity of qualified technical staff and financial resources at the regional administrations and the lack of spare parts and materials have rendered almost all systems incapable of operating properly.

Sanitation coverage has not significantly increased. The EEC sewer rehabilitation program in Georgetown was limited to replacing pumps in the existing 24 pumping stations, replacing main pressure pipes, and replacing the sewer outfall in the center of Georgetown, but this area is still subject to frequent flooding, because the program to replace street and yard sewers has not been implemented due to lack of financial resources.

The solid waste management subsector needs substantial improvement. Garbage collection is irregular and final disposal often is inadequate, leading to the dumping of waste in drainage canals and/or on street parapets. It is estimated that about 11,000 tons of garbage were accumulated in the streets of Georgetown by the end of 1988, and within a year the city will run out of sites for garbage disposal unless planning for a 25-year landfill facility begins immediately. The situation is less critical in other towns and villages.

Two food protection programs are being implemented by the Government Analyst Department: the food contamination monitoring program and the food quality control program. Eating establishments, markets, food processing plants, and slaughterhouses are currently inspected. Samples from food processing plants are regularly analyzed at the government analyst laboratory. All restaurants are issued a permit, and food handlers are normally trained and issued a health certificate. Meat inspections are conducted frequently, but since transportation between slaughterhouses and the market often is inadequate, the meat may be contaminated en route.

The urban drainage system in Georgetown and New Amsterdam consists of minimum slope, open canals with outfalls controlled by kokers (tidal gates) and pumps to prevent seawater from entering the drainage canals at high tide. Those canals really function as a combined sewer system, as they collect all sorts of wastewater such as run-off, domestic wastewater, septic tank effluent, cane-field wastewater, and industrial waste. In addition, uncollected garbage is often dumped into the canals, a practice that increases the possibility of flooding, even from a minor rainfall.

The sector's main problems are common to all its elements—water supply, sanitation, solid waste, drainage, and food protection services. The lack of financial resources and of foreign exchange resulting from the economic crisis which has plagued the country since 1981, have prevented the acquisition of new equipment, material, and spare parts for proper operation and maintenance of existing facilities. In addition, current management practices are inadequate to cope with the crisis.

Other issues such as an adequate transportation system, human resources development, training, and a comprehensive personnel management system should also be considered in order to attract and retain qualified people in the sector.

HAITI

GENERAL CONTEXT

Political, Economic, and Social Situation

Until 1986, the Constitution established a presidency for life. That year, a constitutional vacuum was produced which lasted until the end of the period, despite the fact that in 1987 a new Constitution was approved by an overwhelming vote. In 1989 the Government put into effect most of the articles in the new Constitution, which establishes that the President is to be elected by universal suffrage every five years and cannot be immediately re-elected. The Constitution also provides for a Senate and a Chamber of Deputies. The president appoints the Prime Minister, the Cabinet Ministers, and the judiciary. From 1985 to 1988 there have been five governments.

The Haitian Institute of Statistics and Information Science estimates that the country's overall economic situation deteriorated throughout 1985–1988. The gross domestic product (GDP) decreased from G4,939.9 million in fiscal year 1986 (1985–1986) to G4,919.9 million in fiscal year 1988 (1987–1988), with an average rate of decline of 0.45% over three years. The per capita GDP declined from G904 in 1985–1986 to G858 in 1987–1988 (an average decline rate of 1.7%).

Agriculture, an important component of the GDP, followed the same trend: its aggregate value went from G1,387 million in fiscal year 1986, to G1,422.8 million in 1987, and to G1,398.1 million in 1988 (a decrease of 1.7% in the last two years). This trend was also seen in food production, leading to a sudden rise in food prices, including the price of beans, rice, and corn. The industrial sector also experienced a decline: its contribution to the GDP was G822 million in 1986 and G771.1 million in 1988. The tertiary sector's contribution to the GDP also declined, from G2,423 million in 1986 to G2,367.2 million in 1988 (a decrease of 2.3%).

Regarding international transactions, the sociopolitical context, especially the suspension of foreign aid and overall insecurity, negatively affected the balance of payments, which went from G146.2 million in 1986, to G170 million in 1987, and then down to G108.4 million in 1988 (a decline of 36.4%). In terms of the balance of trade, fiscal year 1988 witnessed a 25.7% decrease in exports and an 8% increase in imports.

External financing fell from G229.9 million in 1986 to G88.7 million in 1988 (a drop of 61.4%). This unfavorable change resulted from the suspension of external assistance, particularly from the Government of the United States of America, beginning in November 1987. The official exchange rate, established by convention in 1919, is five gourdes per United States dollar. However, since 1986 the dollar has been rising on the parallel market.

The gap between needs and available resources has been a matter of growing concern. There are not enough teachers or classrooms to meet the demand. Only 38% of the population between 6 and 24 years of age attends school. Illiteracy continues to be high (63%).

The economically active labor force represents 66.2% of the population of working age. It is estimated that 12% of the latter are unemployed. This proportion, however, underestimates the real situation: many people do not seek work because they simply do not expect to find it, and among the "employed," hidden unemployment and underemployment are prevalent.

Demographic Characteristics

In 1988, the country's total population was estimated at 5,510,917 inhabitants. The age and sex distributions are given in Table 1.

The age pyramid is that of a young population: more than half the total population is under 20 years of age. Priority groups for health actions are women from 15 to 49, who represent 25% of the population, and children under 5, who represent 15%.

The annual population growth rate is 1.4%. Despite much emigration to the United States and Canada, the population's growth rate is higher than that of the GDP for the agricultural sector, which means that the latter cannot produce enough food. There are 94.1 men for every 100 women, owing to high mortality in males and the greater toll of emigration in men. Seventy-four percent of the population lives in rural areas. The urbanization rate is overestimated, since the arrondissement capitals are considered urban, even though they lack electrical services and drinking water supply.

There are significant differences in degree of urbanization among the departments: the West Department,

TABLE 1

Estimated population by age group and by sex,
Haiti, 1988.

| Age group | Both sexes | % of total | Male | Female |
|--------------|------------|------------|-----------|-----------|
| Total | 5,510,917 | 100.0 | 2,664,797 | 2,846,120 |
| Under 1 year | 164,052 | 3.0 | 81,908 | 82,144 |
| 1-4 | 653,436 | 11.9 | 330,579 | 322,857 |
| 5-9 | 743,795 | 13.5 | 372,234 | 371,561 |
| 10-14 | 648,912 | 11.8 | 325,559 | 323,353 |
| 15-24 | 1,081,035 | 19.6 | 511,450 | 569,585 |
| 25-34 | 733,186 | 13.3 | 332,967 | 400,219 |
| 35-44 | 540,145 | 9.8 | 253,214 | 286,931 |
| 45-54 | 404,916 | 7.3 | 200,515 | 204,401 |
| 55-64 | 250,452 | 4.5 | 124,230 | 126,222 |
| 65 and over | 290,988 | 5.3 | 132,141 | 158,847 |

Source: Haitian Institute of Statistics and Information Science, Ministry of Public Health and Population.

which includes Port-au-Prince, is the most urbanized part of the country (49% of its population is urban), followed by the North, Northeast, and Artibonite departments (23%, 22%, and 16%, respectively). In the other departments the proportion of urban population averages around 12%, except for the Southeast Department, which has a low of 8%. The Southeast Department supplies migrants to the metropolitan area of Port-au-Prince.

The concentration of economic activity in the capital, coupled with the deterioration of living conditions in the countryside, has triggered a massive population shift to the metropolitan area of Port-au-Prince. Port-au-Prince's population (684,284 inhabitants) has an annual growth rate of 4.8%, representing 89% of the West Department's urban population. Cap-Haïtien is the second largest city, with 64,406 inhabitants.

Migration abroad also affects the rural areas of Haiti. Many rural inhabitants go to the Dominican Republic to harvest sugarcane. Despite the heavy rates of emigration, the population growth rate will probably remain unchanged in the coming years because of the higher rate of natural growth. The United Nations estimates a natural growth rate of 2.1% for 1988 and a crude birth rate of 34 per 1,000 population. This projected demographic trend must be considered in establishing an overall social policy and a health policy in particular.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

The crude death rate is estimated at 13 per 1,000 population (UN, 1988) and life expectancy at birth at 55 years. Nearly half of all deaths occur among those 5 years of age and younger. Between 100 and 120 in every 1,000 live-born children die before reaching their first birthday, and approximately 200 per 1,000 die before age 5. Maternal mortality is calculated at 23 per 10,000 live births.

This situation may be understood in the context of the precarious socioeconomic conditions in the largest sectors of the population, since most deaths are caused by exogenous factors. Diarrhea continues to be the principal cause of death among children under age 5: one out of every two deaths in children are from diarrhea or respiratory infections or from both causes combined. Poor urban neighborhoods, where 36% of the deaths in children under age 5 occur, are hit particularly hard. However, mortality on the whole shows downward trends.

Health Situation of Specific Population Groups

Child Health

In general, infectious and parasitic diseases are the most important causes of morbidity. Table 2 shows the number of reported cases for the main communicable diseases in 1985 and 1986.

In 1983 a diarrhea-control campaign was implemented to reduce mortality from this cause in infants and preschool children. Prior to that time, 75% of infant deaths and 50% of deaths in children aged 1-4 were caused by diarrhea. This disease was responsible for 20% of all deaths in the country. After almost six years of activities under the program, there appears to be a reduction in deaths from diarrhea, and 54% of mothers are familiar with oral rehydration solutions and know how to prepare them.

Diseases preventable by vaccination are common throughout the country. Even though the incidence of tetanus and poliomyelitis is not very high (Table 3), these diseases remain a serious problem in certain sectors of the infant and preschool population. In 1985, of 318 cases of tetanus, 171 were in children under 1 year of age, and 69% of the deaths were in that same age group.

Immunization coverage in children under the age of 1 is low for DPT, polio, and measles vaccines, and average for BCG (Table 4). During 1985-1988, coverage im-

| Diseases | 1985 | | | 1986 | | |
|------------------------|----------|--------------|-----------|----------|--------------|-----------|
| | All ages | Under 1 year | 1-4 years | All ages | Under 1 year | 1-4 years |
| Diarrhea | 39,215 | 17,803 | 12,267 | 20,349 | 9,041 | 6,560 |
| Intestinal parasitosis | 32,949 | 1,463 | 7,992 | ... | ... | ... |
| Malaria | 22,282 | 2,188 | 4,389 | 10,931 | 994 | 1,923 |
| Pneumonia | 7,484 | 2,444 | 2,895 | 3,254 | 1,117 | 1,216 |
| Pulmonary tuberculosis | 4,993 | 106 | 445 | 3,287 | 130 | 300 |

Source: Epidemiological Bulletin of the Bureau of Public Hygiene, Ministry of Public Health and Population.

| Diseases | 1985 | 1986 | 1987 |
|-------------------|-------|-------|-------|
| Tuberculosis | 126.8 | 157.4 | 143.0 |
| Measles | 39.5 | 4.9 | 56.5 |
| Neonatal tetanus | 1.6 | 1.0 | 3.2 |
| Tetanus, all ages | 5.7 | 2.2 | 7.3 |
| Diphtheria | 1.0 | 0.07 | 0.1 |
| Poliomyelitis | 1.6 | 0.0 | 0.2 |
| Whooping cough | 25.7 | 8.6 | 23.5 |

Source: *Tuberculose en Haiti, 1982-1986*. Bureau of Public Sanitation, Tuberculosis Control Service. Ministry of Public Health and Population, 1982-1986. The data disagree with information published in the bulletins from the same Bureau because of late-breaking information.

proved perceptibly; community and national vaccination days were held in 1988.

Nutritional deficiencies are very common in Haiti, and they are included among the Ministry of Public Health and Population's seven priorities. No recent data are available, but according to 1978 estimates, 75% of preschool children were malnourished: 46% suffered mild malnutrition; 25%, moderate; and 4%, serious. Deficiency anemia is frequent, as is vitamin A deficiency. Of the 4,840 children born in the first half of 1987 at the University of Haiti Hospital, 667 (14%) had low birthweights (less than 2,500 g).

Health of Adolescents and Adults

The Ministry of Public Health and Population carries out specific activities for women of reproductive age. Cur-

| Year | DPT | | Polio | | BCG | | Measles | |
|------|----------|------|----------|------|---------|------|---------|------|
| | 3rd dose | % | 3rd dose | % | doses | % | doses | % |
| 1982 | 2,241 | 12.6 | 11,075 | 6.3 | 101,232 | 57.5 | ... | ... |
| 1983 | 15,765 | 8.8 | 15,518 | 6.6 | 109,657 | 61.1 | ... | ... |
| 1984 | 23,327 | 12.8 | 20,197 | 11.0 | 122,580 | 67.0 | ... | ... |
| 1985 | 43,083 | 19.4 | 40,950 | 18.5 | 165,826 | 74.8 | ... | ... |
| 1986 | 49,108 | 21.8 | 56,909 | 25.2 | 140,681 | 62.3 | ... | ... |
| 1987 | 68,129 | 29.6 | 67,898 | 29.5 | 91,224 | 39.6 | ... | ... |
| 1988 | 109,829 | 54.5 | 109,125 | 54.0 | 97,994 | 48.5 | 126,780 | 62.8 |

Source: Ministry of Public Health and Population.

rently, only 27% of them are completely vaccinated against tetanus.

During 1985–1988 the use of marijuana and other stimulants increased among adolescents. There are two public asylums (200 beds) and several private clinics (50 beds) for the treatment of mental disorders.

It is estimated that the national prevalence of diabetes is 15%. There are no national registration or control programs for cancer or cardiovascular diseases. According to the biopsy data reviewed over the last eight years by the pathology service at the University Hospital, the most frequent cancer sites are the ovary, breast, cervix, prostate, penis, rectum, and stomach.

Problems Affecting the General Population

About 85% of the population inhabits malarious areas. The vector is *Anopheles albimanus* and the predominant parasite is *Plasmodium falciparum*, although cases of *Plasmodium vivax* have been registered in a limited area of the country.

In 1984 the Service for Control of Major Endemic Diseases reported 72,000 cases. This figure is much higher than that provided by the Bureau of Public Hygiene a year later, because starting in 1985 volunteer community collaborators were no longer required as case reporters. The program basically distributes drugs to febrile patients and includes activities to eliminate breeding sites and spray against the vector.

The first cases of AIDS date to 1979. Between 1981 and 1988 a total of 1,849 cases were registered. The number increased rapidly: between 1979 and 1983 only 1 case per month was diagnosed, but since 1986, 40 cases per month have been found. The patients are located primarily in Port-au-Prince and the major cities. The 20–40-year age group is the most affected and the proportion of women among all cases has risen from 10% to 30%.

The two most important zoonoses are anthrax and rabies. The former is endemic in Haiti; from 1985 to 1988, 1,396 cases and five deaths were registered (for a case fatality rate of 3 per 1,000). Vaccination of cattle, goats, and horses is compulsory. The law prohibits the slaughter of unvaccinated animals and requires that every animal suspected of having died of anthrax be burned. During the period, an average of two cases of human rabies were reported per year.

There is no program for oral health in the country. The lack of dentists and limited material and equipment are characteristic of the situation. Activities are limited to tooth extractions.

Between 1985 and 1988 the country suffered localized floods and droughts, and in 1988 Hurricane Gilbert ravaged the southern region and caused severe damage.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

The country's health sector includes three subsectors: public, private nonprofit, and private for-profit. Social security is still incipient. Although there are coordination problems among these three subsectors, efforts are under way to improve coordination between the Ministry and the Association for Private Health Initiatives. Poor sectoral coordination seriously hampers the sector's development.

The public subsector is composed of the Ministry of Public Health and Population, which is governed by an organic law enacted in 1983. This subsector is responsible for the development, definition, and execution of the country's health policy. Haiti is divided into four public health regions, which, in turn, are subdivided into 15 districts and several subdistricts.

The Ministry's policy and strategies were adopted in 1982, and are geared to ensure that the population has the basic right to health through the primary health care system. Priorities, selected according to the epidemiological situation, existing technology, and available resources, are: diarrheal diseases, diseases preventable by vaccination, tuberculosis, and protection of women and children—which includes activities that deal with family planning, malnutrition, and malaria; AIDS was added in 1988. To address each priority, a specific structure has been established, and in October 1988 an office to coordinate priority programs was set up.

In order to ensure the rational distribution and utilization of resources, a regionalized system was adopted and a process of decentralization initiated. Since 1983 the services have been structured according to a pyramidal system, from the primary health worker or nursing auxiliary up to the most complex levels of health care, represented by the hospitals. However, several factors—lack of personnel and equipment, among others—have prevented the system's functioning.

Decentralization advances slowly. Regions and districts participate more actively in planning, but minor decisions continue to be made at the central level.

A planning and evaluation unit has the mandate to study and define the Ministry's overall strategy and to establish, standardize, and update the plans of action. This unit, which includes a planning service and an external assistance service, does not have the capability to complete its tasks. No annual report was issued during the period.

The private nonprofit subsector is made up of non-

governmental organizations which administer health establishments scattered over the most remote areas of the country and care for a significant proportion of the population. Some of the organizations have joined together in the Association for Private Health Initiatives, which aids in community health activities based on the strategies established by the Ministry of Health. The private for-profit subsector consists of privately owned establishments.

Regarding social security, two institutions within the Ministry of Social Affairs conduct health-related activities. The Institute of Social Welfare and Research has a clinic for the diagnosis of sexually transmitted diseases in prostitutes and provides physicians for the orphanages that it administers. The Illness, Maternity, and Work-related Accidents Insurance Office provides health care to its policyholders. In 1986 a total of 53,027 persons in 2,787 establishments were insured. They are examined each year for tuberculosis and syphilis. The Office has a 50-bed hospital in Port-au-Prince, where work-related accidents are treated.

Intersectoral activities are limited, but the participation of various institutions and the community itself played a decisive role in the success of a series of vaccination days held in 1988.

Sixty percent of the population is located within an hour's distance of a health establishment.

There are 49 hospitals, 50 health centers with beds, 88 health centers without beds, and 219 dispensaries (Table 5) administered by the various subsectors. Of these establishments, 60% are public, 18% private, and 22% mixed. Some privately owned establishments that receive some type of public assistance are called mixed.

There are 4,956 hospital beds, which are concentrated in the capital and the major cities (see Table 5). The

capital has 1,776 beds in 22 establishments (2 beds per 1,000 population); the national average is 1 bed per 1,000 population.

Health Services Technologies

Two laboratories produce basic drugs. The oral serum utilized in the oral rehydration program has been produced in Haiti since 1981.

Laboratories are mostly located in the cities and in general are very limited, carrying out only basic tests. The public establishments with laboratories frequently lack personnel and adequate supplies. Diagnostic radiology services are mainly located in Port-au-Prince.

Until 1986 there were several blood transfusion centers under the Haitian Red Cross and a blood bank at the State University Hospital that was closed in 1986. In that year regulations were implemented governing the acquisition, preservation, and distribution of human blood and blood plasma and its derivatives so as to ensure free access to donated blood and blood transfusions through the Red Cross. Currently, there are transfusion centers in the large cities and in some rural hospitals. HIV testing is being introduced in all the centers.

Financing of the Health Services

The sources of health financing are: the State (operating or development budget); bilateral agencies such as USAID; multilateral agencies such as PAHO/WHO, UNICEF, the Inter-American Development Bank (IDB), Rotary Club International, and the Agency for Technical

| | Total | North | Transverse | West | South |
|-----------------------------|-------|-------|------------|-------|-------|
| Hospitals | 49 | 2 | 6 | 36 | 5 |
| Health centers with beds | 50 | 13 | 18 | 6 | 13 |
| Health centers without beds | 88 | 10 | 27 | 46 | 5 |
| Dispensaries | 219 | 44 | 71 | 41 | 63 |
| Total no. of establishments | 406 | 69 | 122 | 129 | 86 |
| Total no. of beds | 4,956 | 665 | 904 | 2,779 | 608 |
| Beds per 1,000 inhabitants | 0.94 | 0.85 | 0.63 | 1.36 | 0.60 |

Source: Ministry of Public Health and Population.

Cooperation of the Federal Republic of Germany; and fees for services.

Public spending on health went from \$US23 million in 1981 to \$US45 million in 1987 (an increase of 95% in six years). From 1981 to 1986, expenditures by non-governmental organizations that receive financing, especially from USAID, went from \$US6 million to \$US30 million, which demonstrates their importance in health services delivery. Total health expenditures on health during 1987 were estimated at \$US128 million (an increase of 77% relative to 1981). In 1987 expenditures on health represented 5.6% of the GDP.

Per capita expenditures increased 65%—from \$US14.4 in 1981 to \$US23.2 in 1987. Despite the increase in the total budget, the proportion of the budget allocated for personnel remained unchanged (85%), because salaries increased from 50% to 75%.

Human Resources

In general, health personnel have been trained in the 12 teaching institutions that come under the Ministry: one school of medicine and pharmacy, one school of dentistry, three nursing schools, five schools for auxiliaries, and two schools for health technicians.

The Ministry of Health, the second largest employer in the country, has 8,054 employees (1988). Personnel are largely concentrated in Port-au-Prince, which has 66% of the physicians, 58% of the nurses, 26% of the auxiliaries, and 50% of the general service staff.

The Ministry cannot absorb all the personnel: of 298 physicians, 229 nurses, and 483 auxiliaries trained between 1985 and 1987, only 164 nurses and 267 auxiliaries were hired.

Health personnel are as unevenly distributed as the health facilities (Table 6); inadequacies are coupled with marked differences among regions. Most of the staff is concentrated in the western region, which includes the country's capital; the largest hospital also is located in

| Number of inhabitants per physician, per nurse, and per nursing auxiliary, by sanitary region, Haiti, 1985. | | | |
|--|------------------|--------|-----------|
| Region | Inhabitants per: | | |
| | Physician | Nurse | Auxiliary |
| Total | 6,593 | 8,028 | 3,637 |
| North | 11,938 | 8,919 | 3,079 |
| Transverse | 21,017 | 23,729 | 3,955 |
| West | 3,700 | 5,078 | 5,706 |
| South | 9,962 | 10,947 | 2,349 |

Port-au-Prince. District hospitals suffer from a serious shortage of specialists, and, consequently, they are unable to provide basic medical, pediatric, surgical, and obstetric services.

Health personnel salaries were amended in 1986. Since then, a physician earns between G2,500 and G3,000; a nurse between G1,750 and G2,400; an auxiliary between G800 and G1,000; and a technician between G1,100 and G1,700. There is no salary policy or schedule.

HEALTH AND THE ENVIRONMENT

A socioeconomic survey carried out in 1986 by the Haitian Institute of Statistics and Information Science revealed that in Port-au-Prince's popular neighborhoods, 63% of the dwellings are rudimentary, 1% have sanitation services, 30% have no toilet or latrine, and 90% have no drinking water supply.

Drinking water distribution comes under the responsibility of two institutions within the Ministry of Public Works, Transportation, and Communications—the Autonomous Metropolitan Drinking Water Center (CAMEP) and the National Drinking Water Service (SNEP)—and one institution within the Ministry of Public Health—the Community Drinking Water Post (POCHEP). CAMEP covers the metropolitan area of Port-au-Prince, SNEP covers the other cities, and POCHEP supplies water to small rural communities. Drinking water coverage is shown in Table 7.

In urban neighborhoods with running water, excreta disposal is usually by means of cesspools without septic tanks. In the poor neighborhoods, latrines with dry pits are used. In the rural environment the lack of latrines is a serious problem.

Proper excreta disposal coverage increased from 19% in the urban areas and 12% in the countryside in 1984, to 42% and 14%, respectively, in 1987.

The capital produces some 847 tons of solid waste per day, and the current disposal system can only absorb one-fourth of that amount. Approximately 635 daily tons of waste are not collected, obstructing the storm drain sys-

| Drinking water coverage, Haiti, 1980–1987. | | | |
|---|------|------|------|
| Geographic area | 1980 | 1985 | 1987 |
| Capital | 48% | 54% | 51% |
| Secondary cities | 47% | 65% | 66% |
| Semirural | 8% | 30% | 35% |

Source: Data collected by PAHO/WHO through programs of the International Drinking Water Supply and Sanitation Decade, Haiti, 1980–1987.

tem and attracting rodents and insects. In Port-au-Prince, refuse collection is handled by the municipal government; in other cities it falls under the responsibility of the Ministry of Public Health.

There is no legislation on environmental sanitation. The Bureau of Sanitation, in cooperation with PAHO/WHO, began to develop an environmental sanitation code at the end of the period.

In December 1987 some 3,000 tons of toxic waste from the United States of America were deposited in Haiti, despite constitutional provisions to the contrary promulgated in March of the same year. This waste remains in the environs of the principal port of the city of Gonaives notwithstanding repeated protests, and represents a public health risk. Installation of concrete vats for its final disposal is in progress.

HONDURAS

GENERAL CONTEXT

Political, Economic, and Social Situation

The years 1985–1988 fall within the country's period of democratization, which began in 1982 and put an end to the series of military governments that had ruled since 1972. This democratization process confronted important factors which, in turn, determined its course—the vast numbers of legal and illegal refugees, the political conflicts in the Central American Isthmus, the Esquipulas II agreements, the still unresolved border problems with El Salvador, and the difficult situation regarding the internal war in Nicaragua.

The foreign debt and the structural adjustments proposed by the World Bank and the International Monetary Fund (IMF) have contributed to a climate of uncertainty in the country's internal political environment.

Signs of the international economic crisis emerged in Honduras in 1981 and worsened during the quadrennium 1985–1988. Productive activity drastically declined, unemployment increased, and inflation deepened. The balance of payments and the public treasury suffered imbalances, and the real income of a large proportion of the population declined. There were difficulties in the internal supply of imported inputs, and private investments dropped as a result of the region's political and social problems, as well as disturbances in exchange and monetary systems. This situation was aggravated by the Honduran economy's vulnerability to external fluctuations affecting the demand and price of its main export products such as bananas and coffee.

From 1976 to 1979, the economy experienced considerable and sustained real growth (an annual 8.5% and 4.7% per capita), while in 1980–1985 and 1986–1988, the GDP's annual growth was 0.9% and 1.1%, respectively. This, coupled with a strong population growth (more than 3%), has led to a drastic deterioration of the population's living conditions, especially among low-income groups. Beginning in 1982, the Government of Honduras, with the financial support of the IMF and later of the U.S. Agency for International Development (USAID), adopted a stabilization policy based on not devaluating the lempira, and has followed a process of distributive adjustment aimed at reducing external and

fiscal imbalances. In addition, a system of "criteria of essential need" was established, which enabled the Central Bank of Honduras to authorize the acquisition of foreign exchange according to priorities in which external loan payments come first.

According to studies carried out by CEPALC in 1980, 50% of the Honduran population earned 17% of the national income, 30% earned 23.7%, and 20% earned 53.3%. The two poorest groups are found among the 50% with the lowest income—the 20% living in extreme poverty and the 10% considered "indigent." If the 1980 level of income distribution were applied to the 1986 population and gross national income, a decline would be seen in the overall living conditions, especially among the lowest-income groups. In fact, by 1986 the number of people living in extreme poverty had increased by 166,000 and the number of poor in general by 245,000, a 23% increase over 1980.

One of the economy's structural features is its limited capacity to generate enough productive employment to absorb the growing labor supply, even in times of vigorous economic growth. During the economic crisis (1980–1985) the situation worsened and overt unemployment went from 8.2% in 1980 to 11.4% in 1987; underemployment in that last year was 32%. According to the 1980 National Agricultural Survey, 90% of agricultural workers are seasonal workers and could be described as underemployed.

High rates of illiteracy and low levels of schooling, particularly in rural areas, as well as inadequate guidance and training at the intermediate and higher levels, are responsible for the fact that more than two-thirds of the economically active population have limited qualifications or have been trained in areas that are already saturated. This deficient occupational integration has led to extremely low work productivity.

Demographic Characteristics

According to preliminary data from the 1988 National Population and Housing Census, corrected for estimated census omissions, the country's population is calculated at 4,377,000, representing a 3.6% growth from 1974 census figures. This growth rate seems somewhat high in terms of the birth and death rates for the interval between

censuses: according to the 1987 National Survey of Epidemiology and Family Health, the gross birth rate was estimated at 38 per 1,000 population and the gross mortality rate at 8 per 1,000 population. The overall fertility rate in 1984 was estimated at 5.3 children per woman and the general fertility at 192 live births per 1,000 women aged 15–49. The preferred number of children ranges from 3 children for women aged 15–19 to 4.5 children for those aged 20–44; these figures are below the fertility levels observed.

Regarding age distribution, according to population projections for 1988 based on the 1974 census and the 1983 National Demographic Survey of Honduras, an estimated 45.9% of the population falls in the 0–14 age group, 51.1% in the 15–64 age group, and 3.0% in the age group 65 and over.

In 1988 the population density was 39 inhabitants per km², but this figure does not reflect the uneven distribution throughout the national territory. Provisional data for 1988 indicate that 58% of the population lives in rural areas, compared with 70% recorded in 1974.

Some 40,000 refugees are estimated to live along the country's borders with El Salvador, Guatemala, and Nicaragua; these persons are under the responsibility of the United Nations High Commissioner for Refugees.

It is expected that by the year 2000 the population will reach 6.85 million, the growth rate will slow, the population will age somewhat, and the trend toward urbanization will increase.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

According to the General Bureau of Statistics and Censuses (DGEC), overall mortality in Honduras is decreasing, going from 9.3 deaths per 1,000 population in 1960 to 4.7 in 1983, which is the most recent year for which information is available. A comparison of the mortality information from the 1972 and 1983 National Demographic Surveys of Honduras, which cites death rates of 14.2 and 8.3 per 1,000 population, respectively (Table 1), shows that these figures are practically twice as high as those recorded by DGEC. If the overall death rate from the 1982 Demographic Survey is applied, the result is 31,176 deaths, compared with the 19,304 recorded by the DGEC.

A similar phenomenon is observed for infant mortality, which, according to DGEC data, decreased from 52.0

| Indicators | 1972 | 1983 | 1987 |
|--------------------------------------|-------|------|------|
| Gross general mortality ^a | 14.2 | 9.5 | 8.0 |
| Urban | 9.0 | ... | ... |
| Rural | 16.5 | ... | ... |
| Infant mortality ^b | 117.0 | 78.6 | 62.0 |
| Urban | 85.0 | 50.9 | ... |
| Rural | 127.0 | 93.5 | ... |
| Life expectancy at birth (years) | 53.1 | 61.0 | ... |
| Men | 50.1 | 59.8 | ... |
| Women | 55.5 | 63.7 | ... |
| Crude birth rate ^a | 49.2 | 44.0 | 38.0 |
| Overall fertility | 7.5 | 6.0 | 5.6 |

^aRate per 1,000 population.

^bRate per 1,000 live births.

Sources: National Demographic Survey of Honduras, 1972 and 1983. National Survey of Epidemiology and Family Health, 1987.

deaths per 1,000 live births in 1960 to 17.4 in 1983. However, data from the 1972 and 1983 Demographic Surveys (Table 1) reveal figures that are 3 and 4.5 times greater than those established by the DGEC. The analysis of infant mortality in Honduras, based on different surveys carried out in the country, corroborates the downward trend reported by DGEC, although with higher figures.

Given that there are signs of significant underreporting, particularly in the rural areas which account for 60% of the population, mortality data should be interpreted with caution. In addition, in 1983, 48.2% of deaths were classified as symptoms, signs, and ill-defined conditions. A recent evaluation revealed that only 11% of registered deaths are certified by a physician and that the forms used do not comply with the format of the International Death Certificate. For the remaining deaths, the cause of death is determined by community auxiliary personnel with little or no preparation to do so.

Table 2 shows the number of notified cases per 100,000 population for the major causes of morbidity that require notification, as recorded by the Ministry of Public Health and Social Welfare between 1984 and 1988.

Table 3 presents the main causes of hospital discharges between 1985 and 1987, and Table 4 shows the ten principal causes of outpatient morbidity determined through random sampling.

| Cause | 1984 | 1985 | 1986 | 1987 | 1988 |
|----------------------------------|---------|---------|---------|----------|----------|
| Respiratory infections | 2,688.6 | 7,530.5 | 9,322.1 | 13,839.4 | 14,409.6 |
| Diarrheal diseases | 4,373.2 | 4,462.1 | 4,732.3 | 6,210.8 | 5,965.9 |
| Malaria | 645.9 | 773.7 | 645.3 | 410.1 | 619.3 |
| Gonococcal infections | 195.7 | 161.8 | 144.2 | 183.4 | 142.4 |
| Syphilis | 111.0 | 98.7 | 99.4 | 125.5 | 85.7 |
| Tuberculosis (respiratory tract) | 46.0 | 49.2 | 77.1 | 84.7 | 77.1 |
| Infectious hepatitis | 38.8 | 37.2 | 35.4 | 36.2 | 38.9 |
| Measles | 118.8 | 148.1 | 13.4 | 30.9 | 24.1 |
| Typhoid fever | 11.0 | 4.3 | 6.1 | 7.8 | 10.5 |
| Leishmaniasis | 4.1 | 4.4 | 8.1 | 6.5 | 6.6 |
| Dengue | 8.8 | 7.0 | 12.6 | 4.3 | 20.0 |

Source: Ministry of Public Health and Social Welfare.

| Leading cause | 1985 | 1986 | 1987 |
|---|---------|---------|---------|
| Total number of discharges | 120,980 | 125,911 | 135,999 |
| Normal delivery | 32,898 | 33,032 | 32,479 |
| Abortion | 5,508 | 6,151 | 6,053 |
| Other fetal problems that affect the care of the mother | 3,161 | 4,731 | 4,801 |
| Ill-defined intestinal infection | 4,628 | 4,485 | 3,585 |
| Asthma | 2,051 | 2,243 | 2,329 |
| Alcohol dependency syndrome | 1,893 | 1,966 | 2,068 |
| Premature delivery | | 1,910 | 1,863 |
| Inguinal hernia | 1,658 | 1,794 | 1,681 |
| Prolonged pregnancy | | 1,553 | 1,592 |
| Bronchopneumonia | 1,768 | 1,537 | 2,221 |

Source: Ministry of Public Health and Social Welfare.

| Cause | 1982 | | 1985 | |
|----------------------------------|--------|-----|-------|-----|
| | Case | % | Case | % |
| Ill-defined intestinal infection | 20,308 | 8.0 | 9,642 | 7.1 |
| Intestinal parasitic disease | 22,682 | 8.9 | 9,383 | 6.9 |
| Influenza | 14,606 | 5.7 | 5,541 | 4.1 |
| Anemias | 15,349 | 6.0 | 4,831 | 3.6 |
| Acute amygdalitis | 5,921 | 2.3 | 4,239 | 3.1 |
| Unspecified bronchitis | 8,929 | 3.5 | 3,729 | 2.7 |
| Common cold | 6,761 | 2.7 | 3,123 | 2.3 |
| Undernutrition | 7,707 | 3.0 | 3,120 | 2.3 |
| Disorders of the urethra | 7,093 | 1.6 | 2,819 | 2.1 |
| Asthma | ... | ... | 2,317 | 1.7 |

Source: Random sample from 5% of the Informe Diario de Atenciones (Daily Report on Health Care). Ministry of Public Health and Social Welfare.

Health Situation of Specific Population Groups

Child Health

Intestinal and respiratory infections are the main problems, along with conditions originating during the perinatal period. In 1983, 69% of registered deaths from diarrhea occurred in children under the age of 5. Diseases

preventable by vaccination continued to decrease: the last case of diphtheria was recorded in 1980; whooping cough, too, declined (in 1988 there were 4.9 reported cases per 100,000 population).

In 1984 there was an outbreak of paralysis, including 57 cases of paralytic poliomyelitis, caused mainly by poliovirus type 1. Types 2 and 3 also were isolated, although in much smaller proportions. Many confirmed cases (42%) showed evidence of complete polio vacci-

nation schemes, which could point to a serious deficiency in the cold chain, significant intestinal interference by other enteroviruses, or both. In 1987, 13 poliomyelitis cases were confirmed and in 1988, 5.

For information purposes, neonatal tetanus was established as a separate entry in 1984; from that year until 1986, its rate moderately increased. However, an operational study revealed underreporting of cases and defined risk situations in which women of childbearing age should be vaccinated against tetanus. Non-neonatal tetanus rates have remained relatively stable, except in 1986 and 1987 when there was a slight increase.

In 1966 a national nutritional survey was conducted among 657 children under the age of 60 months. In 1987, 3,412 children of the same age group were examined (31.6% from urban areas and 68.4% from rural areas). An analysis of the data from both surveys, carried out according to National Center for Health Statistics (USA) standards, revealed prevalence figures indicating an overall undernutrition of 43% in 1966 and 38% in 1987 based on the weight-for-age indicator. Chronic undernutrition was shown to be 60% in 1966 and 44.7% in 1987 based on the height-for-age indicator, while figures for acute undernutrition were 4.7% in 1966 and 3.9% in 1987 based on the weight-for-height indicator. In both surveys these prevalence figures are a result of mild and moderate undernutrition.

Health of Adolescents and Adults

Little research has been conducted on the status of adolescents, but there are signs that alcoholism, smoking, drug addiction, and mental diseases are increasing in this group.

Honduras has no programs to determine the health status of adults or to address it. Available information suggests that violence and accidents are an important problem among the adult population.

According to the 1983 National Demographic Survey of Honduras, the average age at which sexual relations were initiated was 15. In addition, according to the National Survey of Epidemiology and Family Health (1987), only 4.2% of all women who had sexual intercourse for the first time between the ages of 15 and 25 used some kind of contraceptive method. Finally, data of the Maternal and Child Health National Survey (1984) show that 5.3% of pregnancies occurred in adolescents.

According to the National Survey of Epidemiology and Family Health (1987), 27% of women of childbearing age used contraceptives; 65% of pregnant women received institutional prenatal care and 54% received prenatal care by a trained midwife, which indicates that some pregnant women receive both; 60% started prenatal care in their first trimester; and 67% had more than three

institutional check-ups. According to the same survey, only 24% of deliveries were institutional; of these, 90% were normal deliveries, 29% were assisted by trained traditional midwives, and 47% were assisted by traditional midwives and other untrained personnel having no ties with the health services system.

In 1987 maternal mortality in hospitals was 11.3 per 10,000 live births. The main causes of death were hemorrhagic complications, followed by infections and hypertension. Fourteen percent of maternal deaths occurred in women under the age of 18, 64% in women between 18 and 35, and 22% in women over 35.

A study conducted in five of the country's hospitals showed that 5.3% of deliveries among adolescents were dystocia, 50% required forceps, and 14% were cesarean sections. The main complication during delivery in this group was hypertensive disease induced by pregnancy, and the major causes of death were eclampsia, physical immaturity of adolescent mothers, and infections.

According to the 1987 Nutritional Survey, 12.3% of women of childbearing age suffer from some form of anemia.

Of the malignant tumors found, 38% of those in the general population and 53% of those in women were diagnosed as cervico-uterine cancer.

In 1987, 30% of the population (1,313 million inhabitants) was economically active; of these, only 14% were covered by the Honduran Social Security Institute (IHSS). According to IHSS records, 2,147 work-related accidents were registered in 1987 (an increase of 2.4% compared with 1983). Some 1,220 accidents (57%) occurred in the manufacturing industry, 281 in the trade sector (13%), 220 in the building industry (10%), and 426 in all other activities. Ninety-one percent of them occurred among men, the 20–29 age group being the most affected. Sixty-three percent of all accidents occurred in the city of San Pedro Sula, which has most of the industrial activity in the country. The most frequent work-related accidents were contusions and abrasions, cuts and lacerations, fractures, and foreign bodies in the eye.

Health of the Elderly

Honduras considers as elderly those 54 years of age and over; they represent 6.5% of the overall population. Among the many health problems affecting this age group are nutritional problems caused, among other factors, by a low economic level. Arthritic diseases and uncorrected visual defects also constitute health problems. The causes of death in this group are difficult to determine, since 75% are registered as symptoms, signs, and ill-defined conditions. Of the remaining 25%, 7.2% are diseases of pulmonary circulation and other forms of heart disease, 4% are other diseases of the digestive system,

and 3.6% are other diseases of the respiratory system. The Ministry of Public Health is the only institution that deals with this population group, but it does not have specific programs. The country only has five nursing homes for the elderly and the disabled.

Problems Affecting the General Population

In 1985 and 1986, a drought that affected mainly the southern region, particularly the Departments of Choluteca and Valle, led to the creation of a special program of food donations and support for that region. In 1988, on the other hand, rainfall during the winter months was extremely heavy. This situation was aggravated by Hurricanes Gilbert and Joan which, although they did not directly hit the country, brought heavy rains that triggered floods and landslides in settlements located in the foothills.

The armed conflict in Nicaragua continued to affect border areas between Honduras and that country. In late 1988, medical care of refugees (around 40,000) living in the camps created for them, came under the responsibility of the Ministry of Public Health.

The country's first case of AIDS was discovered in 1985; the number of cases has increased since then, reaching 232 as of 31 December 1988. Most of them were among men; 84.5% were in the 20–49 age group; 14.2% were homosexuals; and 66.8% were heterosexuals. Most of the cases are in San Pedro Sula (55.6%) and Tegucigalpa (15.9%).

Leprosy occurs in the southern region of the country, particularly in the Departments of Valle and Choluteca, where about 100 cases have been registered.

There is a large and persistent incidence of caries and periodontal disease. A 1987 national survey of 4,800 children showed that only 2% were free from caries. In addition, the level of oral hygiene, determined on the basis of soft deposits and dental calculus, was poor or very poor in most (more than 90%) of children examined, with no significant differences between rural and urban areas.

In 1976–1987 an average of eight cases of human rabies were registered yearly. The only case in 1988 occurred in January, and by March 1989 no human rabies cases had been reported for more than a year.

Cysticercosis is still a major problem in pigs, the cycle being perpetuated by the inadequate disposal of human excreta. Brucellosis is both a veterinary problem and an occupational disease among slaughterhouse workers. Occasional tests performed in isolated cases have shown that toxoplasmosis does exist in the country, although the scope of the problem is unknown.

According to indicators from malarious areas, 93.2%

of the population in these areas is at risk of contracting malaria. From 1982 to 1984, information from the antimalarial program clearly showed a decrease in the disease. The incidence per 100,000 population went from 1,585, to 999, and then to 707. During the first six months of 1985, this trend continued in all public health regions, although it was greater in some than in others. During the second half of 1985, administrative problems, especially the lack of inputs (antimalarial drugs and insecticides), contributed to the deterioration of the program, and the incidence rose to 846 per 100,000. The recorded incidence decreased to 697 per 100,000 in 1986 and 441 in 1987, the latter being the lowest figure recorded for the last ten years. In 1988, the incidence was 665 cases per 100,000 population, with large regional variations. The deterioration of the malaria control program was caused largely by administrative and labor problems, and natural factors only aggravated the existing situation.

The country's regular program to control the dengue vector only operates in major cities, and, although it does not always meet its goals, it keeps indexes of infection below the limits regarded as acceptable. Both epidemiological surveillance and the availability of information are inadequate. In 1987 the city of Choluteca suffered an epidemic outbreak of dengue caused by serotype 4. Statistically reliable surveys made it possible to estimate 9,500 cases. Dengue serotypes 1, 2, and 4 have been detected in Honduras.

No program exists for controlling the Chagas' disease vector or the patients. Only one study has been conducted on vector and case prevalence, which has served as the basis for developing a control program. Through a 1983 national survey, it was estimated that 6.7% of the dwellings were infested with the vector and 7.2% of the inhabitants were serologically positive.

Honduras has no program for the control of leishmaniasis, and no prevalence studies have been conducted that could provide specific data on the magnitude of the problem. However, based on hospital demand and on small studies focusing on areas with many patients, this is considered a health problem that must be dealt with.

Available information on the nutritional status of the Honduran population is based mainly on nutritional surveys carried out in 1966 and 1987 in children under 5 (see the section on child health).

A survey of 1,049 families revealed that approximately 50% consumed less than 2,000 Kcal, and 40% of these consumed less than 1,900 Kcal. In short, 63% of the families surveyed consumed less than the recommended amount, and of these, 5% consumed less than half the required amount.

Regarding specific nutrients such as iodine, 4,414 school-age children were examined in a 1987 survey to

determine the prevalence of goiter. A prevalence of 8.8% was estimated, which, when compared with the figures for 1966 (17%), represents an improvement of almost 50%. Prevalence was greater in rural than in urban areas (9.1% and 8.6%, respectively) and greater in women (9.7%) than in men (8%). The figures show a decrease in the prevalence of goiter over the last 20 years, and they are below the minimum required for the determination of an endemic area. Analysis of the figures by geographical area reveals that in three public health regions the prevalence is higher than the minimum required to qualify as an endemic area for goiter. Through this same survey, a national study was conducted on iodizing salt for household use, and it was found that 70% of the salt samples had iodine levels lower than 5 mg per 100 g of salt (according to the Honduras salt iodization law). A comparison of data on goiter prevalence and iodine levels in salt revealed that the public health regions with lower indexes of iodization had the highest figures for goiter prevalence. In the regions most affected, more than 60% of the families consume salt containing insufficient levels of iodine.

Data on vitamin A compiled in 1987 indicate that 73% of families consume less than 50% of recommended levels. In that same year, 67% of the families were shown to have a daily per capita intake of iron lower than 15 mg but higher than 10 mg, which is considered an acceptable level since the main source of iron for more than half the families is iron of animal origin.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

Health services are provided by both the public and private subsectors. The public subsector encompasses the Ministry of Public Health and Social Welfare as the regulatory agency (60% of coverage), the Honduran Social Security Institute, the National Autonomous Water Supply and Sewerage Service, the National Social Welfare Board, and the Ministry of Labor's Department of Medicine, Hygiene, and Occupational Safety. The private subsector includes approximately 26 hospitals (with more than 1,000 beds), some of which are financed and administered by religious groups.

The services provided by the Ministry of Public Health are structured into six levels of care and are linked by a weak referral system, from the simplest community level to the most sophisticated national hospitals. The service

network is organized into eight public health regions which are, in turn, subdivided into health areas (35). This division does not coincide with the country's political-administrative divisions.

Installed Capacity

In 1988 the Ministry of Public Health had 705 establishments in its service network (an increase of 20% over 1984), including 22 hospitals, 2 maternal and child clinics, 156 health centers with a physician, and 525 rural health centers without a physician; most of the installed capacity increases were in hospitals. Of the 22 hospitals, 6 are considered to operate on a national level. There are four hospitals with about 800 beds, which, although completed two years ago, are still not in service for budgetary reasons.

In terms of hospital capacity, the public sector has 4,334 beds (3,672 under the Ministry of Public Health and 662 under the Honduran Social Security Institute), representing one bed per 1,000 population. From 1984 to 1988, the number of beds increased by only 9%, especially in the Institute. There are 3.1 discharges per 100 population; 33% of these are deliveries. The private sector accounts for approximately 30% of all discharges in the country. On the average, the rate of occupancy in the hospitals under the Ministry of Public Health was 73%. In accordance with Ministry policy, most deliveries in rural areas are carried out by traditional midwives. In urban areas, on the other hand, deliveries are at hospitals.

Health Services Technologies

During the period under review, there was a shortage of drugs at the public and private levels as a result of the lack of foreign exchange and due to administrative and political factors. The scarcity of drugs has seriously affected the prestige and operation of the sector.

Among the factors affecting drug supply, the following deserve mention: (1) the country produces a mere 10% of needed drugs; (2) only part of the available budget is actually used (60% in 1988) due to the lack of foreign exchange; (3) the bureaucratic transactions involved in the purchase of drugs by the Honduran Social Security Institute and the Ministry of Health are cumbersome; and (4) there is no rational use of drugs nor inventory controls, and careless prescription practices and poor storage and distribution lead to losses. In addition, there is no quality control for imported drugs or for those produced locally.

Financing of the Health Services

The period under review witnessed a reduction in expenditures and frequent budgetary cuts, particularly in 1988. Consequently, the Ministry of Public Health has had to follow a primarily institutional care policy because resources from recovery quotas or service fees only amount to between 3% and 4%. Financing comes from international cooperation funds (24%–26%) and the overall budget (70%). Expenditures for health services provided by the public subsector at one time represented 5.6% of GDP. In general, the Ministry of Public Health's budget allocates 59% for personnel expenditures, 23% for supplies, and the balance for transfers and investments.

The Social Security Institute finances 90% of its expenditures with employee/employer contributions and 10% with State subsidies. This institution has been affected by a severe economic crisis generated by unemployment, its own quota system, the growing competition of other social welfare institutions, and the fact that the State is in arrears.

Since no significant increase in either the health or the overall budget is expected in the near future, the leadership and management activities of the Ministry of Public Health have focused on strengthening local programming and administration in a context of full social participation, so as to help reduce the existing health debt.

Health Planning and Administration

The process of increasing the health services coverage which began in the early 1970s, continued with ups and downs. During 1986–1988 the process was reviewed based on the premise that in order to attain the goal of health for all by the year 2000 the population's welfare had to improve, and that the agreed-upon goal and objectives should ensure that the health sector would contribute to reduce social inequities in the Honduran population. As a result, during 1987–1988 the Ministry of Public Health intensified communications among various entities, based on an analysis of health sector problems: accessibility, health status, effectiveness, and efficiency. In 1988 a national agreement was reached regarding local health systems. These local health systems, whose main objective is to strengthen the links between health service providers and the population areas, help to increase coverage as a way to develop the health system and help provide leadership (policy-making) and management for the process of change.

In addition, significant efforts to enhance coordination have been undertaken, particularly with the Honduran Social Security Institute. At the political level, legislative

initiatives, such as the Sanitary Code and the Unified Health System, are being pursued to facilitate coordination among institutions.

Human Resources

During 1984–1988 there was an average of 4.2 physicians, 1.6 nurses, and 0.8 dentists per 10,000 population. This situation is worse regarding technical personnel, who are trained in only four areas (x rays, laboratory, anesthesia, and medical records), and auxiliary personnel, who receive training only in nursing. Availability is still limited or nonexistent, particularly in dental hygiene, nutrition, and equipment maintenance.

Overall information on the availability of human resources in the health sector shows that 59.5% are employed in the Ministry of Public Health, 14.2% in the Social Security Institute, 4.9% in the National Autonomous University of Honduras, and 21.4% in private institutions; the last figure contrasts with the low coverage provided by the private sector. Of the health personnel working in the Ministry of Public Health, 21% are physicians; 9%, nurses; and 70%, nursing auxiliaries. In the Honduran Social Security Institute, proportional availability of personnel by categories did not change during 1984–1988, except for administrative personnel, where the figure tripled.

Information on the availability of human resources by occupational category in the private subsector is incomplete. However, partial and preliminary information obtained from a study conducted by the Science and Technology Unit in the Ministry of Public Health reveals that of 1,917 licensed physicians, 1,138 work in the Ministry, 699 in the Social Security Institute, and 779 in the private subsector, most of which work in one of the two previous institutions as well.

Despite the limited availability of health personnel, there are signs of unemployment, which affects mainly physicians and nurses. This is a result of the limited hiring capacity of the Ministry and the Social Security Institute, the population's low purchasing power, and recent manpower training. Recent analyses seem to show that most trained health personnel do not meet the needs set forth by the policy and the health care model that the country is trying to implement in response to the epidemiological profile. There is, for example, an overabundance of specialists (50% of the physicians), while some basic areas (pathology) are completely ignored.

Furthermore, 66.2% of the personnel employed by the Ministry of Health work in hospital services and 25.9% in outpatient care. A similar situation is seen in the Social Security Institute, where 48.3% work in hospital services and 26.5% in outpatient care. The remaining personnel

are employed in administrative and technical services. This situation is the result of a health care concept that is primarily curative, biologically oriented, and centered around hospitals. Geographical distribution is still uneven, with a greater concentration of the Ministry's medical, nursing, and auxiliary personnel in the capital city.

The Ministry of Public Health has made a considerable effort to involve the community in identifying and solving its health problems. To this end, it has trained thousands of midwives, health wardens, health representatives, volunteers, litrosol distributors, and, more recently, teachers trained in vaccination, all of whom support some health program. Their training and continued employment, however, have been hampered by the Ministry's lack of supervisory capability, the weakness of supply networks, the absence of a formal program of incentives, and the slow progress of social participation in health, the latter being mostly a political and extrasectoral factor. This strategic area regained momentum in 1986, coinciding with the beginning of the leadership and management process.

HEALTH AND THE ENVIRONMENT

Even though there have been important advances in areas such as drinking water supply in rural and urban areas and in sanitation and pollution control in recent years, overall environmental health conditions in Honduras are still unsatisfactory.

Currently, the environmental health activities in Honduras come under the responsibility of the Ministry of Public Health, the National Autonomous Water Supply and Sewerage Systems Service, the National Autonomous University of Honduras, the Metropolitan Department for Urban Clean-up of Tegucigalpa, the Honduran Social Security Institute, the Ministry of Labor and Social Welfare, the Municipal Water Division of San Pedro Sula, the National Electric Energy Company, and other institutions such as universities and municipalities.

In urban areas, water is supplied through household connections, subject to restrictions and temporary suspensions during the summer. The urban population without household connections but which resides within easy access to the distribution network is supplied from public standpipes. The rest of the population without this service purchases its water in large cities or obtains it from surface water sources, which usually are polluted. The sanitary disposal of excreta in urban localities is handled partly through connections to sewerage systems and partly through latrines.

According to the 1987 National Survey of Epidemiology and Family Health, 68.2% of the population has access to water supply services and 59.5% to sanitation services. Water supply and sanitation coverage in the

urban sector did not change substantially during 1973–1987, although the number of residents with household connections has increased. Drinking water supply services have improved notably in rural areas, from a coverage of 12% in 1973 to 55.7% in 1987.

Liquid waste disposal in urban areas increased from 49% in 1973 to 88.5% in 1987. In rural areas, sanitary disposal of excreta is basically done through the use of latrines, with an increase in coverage from 11% in 1973 to 41.8% in 1987.

The rapid population growth, as well as the social and economic changes the country has experienced, has profoundly affected the environment. Increased consumer patterns require the production, transformation, and transportation of ever-growing chemical substances and raw materials which generate even more industrial wastes, adding to the problem of solid organic wastes produced by the population.

Rampant deforestation is changing the microclimate of the country's main basins, which, in turn, affects the replenishment of already limited water resources and intensifies desertification and soil erosion.

At the beginning of 1986, Honduras made significant progress by creating the Center for Study and Control of Pollutants (CESCCO) as a joint project of the Ministry of Public Health, the Government of Switzerland, and PAHO/WHO. Studies are under way to determine the heavy-metal pollution levels in Lake Yojoa. Activities are being undertaken to preserve the quality of the El Cajón reservoir and its basin, and research is being carried out on the effects of pesticides on the health of the population of the Ajuterique region. It should be noted that there are 360 registered brands of pesticides and that Honduras is one of the nations classified as using "excessively high" amounts of chemical substances.

Although solid wastes are one of the causes of environmental pollution in Honduras, activities for coping with them are not well developed. Population growth, particularly in urban areas, leads to sharp increases in the volume of generated solid wastes. Industrial growth, as well, produces wastes that may be highly toxic and may cause severe pollution problems. Thirty-six of the 284 municipalities have solid waste management and treatment services, referred to as "clean-up trains"; these cover 20.4% of dwellings. Only in Tegucigalpa and San Pedro Sula can the final disposal be categorized as partially controlled landfills. All other cities use open-air dumps that pollute the air, surface water currents, unprotected wells, and, of course, the soil. Liquid wastes are generally discharged into and pollute surface water currents that run through the city, a common practice in the Tegucigalpa area. Professional and technical staff in this field is very limited, and legislation and regulations are not only obsolete and ineffective but also are not being applied, par-

particularly by the agencies involved in planning, promotion, and coordination.

In Honduras there are approximately 35,000 establishments that prepare, handle, and sell food, of which 80% are registered. According to the Division for Food Control of the Ministry of Public Health, 50% of the samples taken from food products indicate that they are

inadequate for human consumption. On the whole, milk products are the most vulnerable, since 90% of them are hand produced on a small scale and are considered unfit for human consumption. It is estimated that, mainly because of staff shortages, only 45% of the approximately 6,580 food-products sold in the country are subject to controls.

JAMAICA

GENERAL CONTEXT

Political, Economic, and Social Situation

Jamaica, the third largest island in the Caribbean, gained independence from the United Kingdom in 1962. It is governed as a two-party democracy, with a Governor General as Head of State, a bicameral legislative body, and a judiciary body.

The party which had been in power since 1980 successfully managed the economy, moving from economic decline to economic growth. However, the stringent policies followed resulted in serious dislocations at individual and family levels. The newly elected opposition party, which came into power in February 1989, is committed to "putting people first" and has stressed the continuity of economic and social development programs already under way. Changes in orientation are indicated in the following areas: increased local government authority and responsibility, strengthening of the civil service, better relationship with CARICOM countries, and increased community participation at decision-making levels.

The country's economy has traditionally been based on agriculture, with sugar, bananas, and citrus as staple export crops; since the 1950s, tourism and bauxite mining became the major earners of foreign exchange. Jamaica's economy was seriously affected by a sharp decline in income from bauxite export and by the global economic recession of the 1980s. Tourism now ranks as the lead foreign exchange earner.

Stabilization and structural adjustment policies, including devaluation of the Jamaican dollar and strict control of government spending, were showing positive results by 1988. The fiscal deficit was reduced from 17.7% of the gross domestic product (GDP) in 1980-1981, to 6.6% in 1984-1985, to 3.2% in 1986-1987, and to 2.2% in 1988.

The GDP at constant prices showed a declining trend (despite small recoveries) to 1985. In 1986, GDP at constant prices was \$J1,870 million, an increase of 2.2% over the 1985 level; in 1987, the estimated level (\$J1,967 million) was 5.2% above the 1986 level. The percentage contribution to GDP in 1987 was: agriculture, forestry, and fishing, 8.4%; mining and quarrying, 5.4%; manufacturing, 16.6%; construction and installation, 5.8%;

and services, 69.6%; less imputed service charges, 5.7%. All sectors except government services and agriculture experienced strong growth.

Agriculture, manufacturing, and tourism were the sectors most damaged by Hurricane Gilbert in September 1988, followed by the housing subsector. The growth in real GDP, projected at 4%-5% for 1988-1989, is now estimated at 1%-2% for 1988 and 3% for 1989. Per capita GDP, at constant prices, declined from 1981 to 1984. Although the population increased by 0.4% from 1986 to 1987, this increase was outpaced by increases in both current and real GDP, resulting in a 4.8% increase in per capita GDP from 1986 to 1987.

The external debt was estimated at \$US4,013.4 million by December 1987, an increase of 13.9% over the previous year's total. The burden of debt on the economy is pronounced. In 1985-1987, 41% to 43% of total expenditure has gone towards amortization and interest payments.

In general, between 1984 and 1987 expenditures for imports exceeded earnings from exports. Nontraditional exports, such as garment exports, have increased. Imports of food, construction materials, and transportation equipment also have increased.

The inflation rate for 1987, as measured by the Consumer Price Index, was 8.4%. There was a steady decline in the growth rate in the Consumer Price Index from 31.2% in 1984 to 8.4% in 1987. As a result of Hurricane Gilbert, the 1988 change might be greater than the estimated 10.5%. During 1987-1988 the rate of exchange has remained stable.

In 1987, 21% of the labor force was unemployed, the lowest recorded unemployment level since 1979, and representing a decline of 2.7% from the 1986 level. The manufacturing sector showed the greatest increase in employment, and women showed significant increases in employment rates, from 64% in 1984 to 71% in 1987. While unemployment rates for men under 25 years old increased in 1987 (28%) over 1986 (26%), the rate was still below the 1984 rate (30%). In 1987, part-time work also declined, but the proportion of female part-time workers is still significantly higher than the proportion of males. Increased attention was given to child care and protection and to youth training and development programs which have contributed to reduce unemployment.

An estimated 83% of the 3–5-year age group is enrolled in pre-primary school, and more than 95% of the 6–11-year age group is enrolled in primary school. Average attendance at primary schools in eight selected parishes with a compulsory attendance program is 55%–69% for all schools and 67%–77% for primary schools. Of the estimated population in the 12–16-year age group, 85% are enrolled in secondary institutions. Enrollment in tertiary institutions decreased by 2.9% in 1987. Approximately 25% of the population is functionally illiterate.

The Government has shifted from being a major supplier of shelter to being a catalyst and facilitator, encouraging investments for shelter. This strategy involved improving finances for housing and making credit more accessible. An estimated 15,000 new housing units per annum are needed, and approximately 2,000 units were completed in 1987. In 1988, the housing sector suffered severe damage from Hurricane Gilbert, estimated at \$1.9 billion. In the hurricane's aftermath, a building stamp program was started to provide aid to some 100,000 low income households; however, this program was not completed and there has been a change in government.

Social security is provided through the contributory national insurance scheme, which provides grants and pensions for contributors and their dependents, and through the noncontributory Social Assistance Program, which covers food and relief to the poor and public assistance. Food aid was initially provided for approximately 400,000 persons. Approximately \$37 million was paid in food and benefits in 1987. After Hurricane Gilbert, the food stamp program was increased by \$21 million to assist in purchasing household food supplies after the disaster.

Demographic Characteristics

The 1987 estimated population was 2,355,400. Rural dwellers account for 52.2% of the population and urban dwellers for 47.8%. Females represent 50.9% of the population, with almost half of them (22.4% of the total population) in the 15–44-year age group. Children under 5 years old account for 12.2% of the population and children aged 5–14 account for another 26.1%.

In 1987, the crude birth rate declined to 22.2 per 1,000 population and the crude death rate was reported at 5.3 per 1,000. These figures do not take into account the well-recognized problem of underregistration.

There has been an increase in migration out of the country, mostly affecting the 20–59-year-old working age group. It is estimated that about 20% of emigrant workers are highly skilled. External migration and reduced fertility rates have reduced the population growth

rate, estimated at 16.9 per 1,000 population in 1987. The annual population growth rate has been declining since 1983.

While the young dependency ratio declined, increased life expectancy (69.1 years for males and 73.9 for females) has resulted in an increase in the aged dependency ratio. Total dependency ratio in 1982 was 83 per 100 population aged 15–64 years.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

The country's systems of birth and death registration and of cause-of-death medical certification have deficiencies (many births and deaths are not registered). However, the large proportion of births taking place in hospitals benefits the registration of live births. Some institutions have full-time registrars, and there is mandatory registration of hospital births with or without parent participation.

A 1986 study on registration of live births, stillbirths, and neonatal deaths indicated there was underregistration, particularly of stillbirths and neonatal deaths. It is estimated that 28 deaths per 1,000 live births would be a realistic figure for the infant mortality rate. There is also underregistration of violent and accidental deaths due to inquest delays. The ten leading causes of death are shown in Table 1.

Leading causes of hospitalization, which account for 59% of hospital admissions, are normal deliveries, accidents and violence, complications of pregnancy, complications of childbirth and the puerperium, diseases of the genitourinary system (some of which are related to sexually transmitted diseases), and cardiovascular diseases. Hospital admissions remain highest for infants, followed by those for the 65 and over age group.

Curative services in primary care centers are utilized mainly for trauma and injuries, treatment of hypertension, leg ulcers, respiratory tract infections, skin disorders, and diabetes mellitus. These leading causes accounted for 55% of users of these services in 1986.

Health Situation of Specific Population Groups

Child Health

Diarrheal diseases are a leading cause of death in children under 5 years old, ranking second to conditions

| Causes of death (in 1981 rank sequence) | Deaths | | Rate per 100,000 | |
|---|--------|-------------------|------------------|-------------------|
| | 1981 | 1982 ^a | 1981 | 1982 ^b |
| All causes | 12,578 | 10,799 | 581.66 | 490.84 |
| Cerebrovascular disease | 1,967 | 1,772 (1) | 90.96 | 80.54 |
| Heart disease | 1,933 | 1,703 (2) | 89.39 | 77.41 |
| Malignant neoplasms | 1,648 | 1,657 (3) | 76.22 | 75.31 |
| Hypertensive disease | 762 | 653 (4) | 35.24 | 29.68 |
| Diabetes mellitus | 484 | 517 (5) | 22.38 | 23.50 |
| Pneumonia and influenza | 400 | 287 (7) | 18.50 | 13.04 |
| Infectious intestinal disease | 365 | 336 (6) | 16.88 | 15.27 |
| Nephritis, nephrotic syndrome, and nephrosis | 220 | 176 (9) | 10.17 | 7.99 |
| Accidents and adverse effects | 202 | 131 (10) | 9.34 | 5.95 |
| Certain conditions originating in the perinatal period | 188 | 185 (8) | 8.69 | 8.41 |
| All other certified causes | 4,409 | 3,382 | | |

^a Ranks for 1982 are shown in parentheses.

^b These rates are calculated from an estimated population figure of 2,200,100 for 1982.

Note: The rates appearing in this table are based on certified deaths occurring in 1981 and 1982 instead of deaths registered during those years.

originating in the perinatal period. Malnutrition and nutrition-related diseases are among the leading causes of mortality, and the increased severity of the problem due to the economic recession is a matter of concern. In 1986 malnutrition/gastroenteritis cases as a percentage of total admissions increased markedly at the main Children's Hospital. The 1985 health status survey indicated that only 59% of children aged 0–59 months were of normal nutritional status, while 32.8% suffered Grade I (Gomez) malnutrition, 6.9% suffered Grade II, and 1.0%, Grade III. Iron deficiency anemia in infants and in pregnant and lactating women is still quite prevalent. The increase in gastroenteritis is linked to an increased prevalence of malnutrition, to environmental health and hygiene problems, and to staff shortages and high turnover rates in the health sector. Child abuse is now more frequently reported, and although a program has been started, more resources are needed to deal with the problem.

The immunization program is proceeding well; in 1988 there was a suspected but unconfirmed case of poliomyelitis. Coverage in the immunization program has reached approximately 82.8% for poliomyelitis, 82.1% for DPT, and 34.1% for rubella.

In an effort to reduce infant mortality, the maternal and child health program focuses on the following areas: reducing preventable childhood diseases of measles, diphtheria, whooping cough, tetanus, polio, and tuber-

culosis through education and immunization of all children up to 7 years of age, with priority to the under 1-year-olds; reducing morbidity and mortality from diarrheal diseases in children under 5 years old through education and the use of oral rehydration therapy; and reducing perinatal mortality through education, promotion of clinic attendance, and ongoing training to improve quality of care.

Health of Adolescents and Adults

Death by accident and violence demands more urgent attention. These deaths showed the most significant percentage increase in mortality in recent years, particularly in the young male population.

The estimated maternal mortality rate of 11.0 per 10,000 live births is also significant, as recorded rates underestimate the problem. Also, many of these deaths are assessed as preventable. Through education, promotion of clinic attendance, ongoing training to improve quality of care, and efforts to increase the number of acceptors of family planning, the maternal and child health program is trying to reduce maternal deaths.

Hypertension stands out as a major cause of ill health and premature death and is the largest single cause of maternal mortality. It is estimated that about 50,000 per-

sons in Jamaica could benefit from treatment for severe hypertension.

It is estimated that 1,600 new cancers are diagnosed annually. Malignancies account for approximately 12% of all deaths. Carcinoma of the uterine cervix is significant, with an incidence of 36 per 100,000 population. Cancers of the cervix and breast account for 44% of female cancers, underlining the need for expanding screening programs.

Services for the aged were improved but still do not meet existing needs.

Problems Affecting the General Population

Imports and an increased domestic production have made available a wide variety of food. Specific vitamin deficiencies are rare, and undernutrition results from inadequate food intake rather than insufficient intake of specific nutrients. Increasing obesity also is of concern.

Tranquilizers are often used to deal with psychiatric disorders, and the scope and seriousness of the problem might be underestimated. Drug abuse has emerged as an important problem for health and other sectors. The National Council on Drug Abuse coordinates the national prevention and control efforts.

AIDS now has priority attention among the communicable diseases. The total number of cases is still relatively low, with 80 cases identified; approximately 56 deaths have occurred. Other sexually transmitted diseases remain a serious problem and there is increased incidence of congenital syphilis.

There is a high incidence of dental disease. Preventive programs are being carried out and salt fluoridation has been introduced.

After Hurricane Gilbert's devastation, disaster preparedness is recognized as a high priority. The country is prone to hurricanes, earthquakes, and floods; consequently, improved preparedness at institutional and parish levels is critical. Disaster response is coordinated by the Office of Disaster Preparedness.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

The Ministry of Health is the country's main provider of health care services, which include a broad range of preventive and curative activities, environmental health efforts, and training for a variety of health professions.

Government health services are structured in four main administrative levels—national, regional, parish, and district.

At the national level, the Ministry is organized into administrative and technical divisions. The Permanent Secretary, in addition to coordinating the work of the Ministry, supervises the administrative division. The technical division is headed by the Chief Medical Officer, who coordinates and supervises units with specialized technological functions, including primary and secondary health care services.

The private sector also is actively involved, mostly at the primary care level. There are five private hospitals in Kingston, one in Mandeville, and one in Montego Bay, with a total capacity of 282 beds. These institutions account for less than 1% of inpatient admissions per year. Fee for service care also is provided at nursing homes, in company-owned and specialized clinics, and by some 450 private practitioners working full- or part-time. The private sector also offers some popular insurance schemes.

The Principal Medical Officer for primary care, who heads the primary care unit at the Ministry, is responsible for countrywide field services. The island has been divided into four health regions, but only two have been established to date; the other two have some officers in place.

At the parish, the basic administrative level for primary health care, the Medical Officer (health) coordinates the activities of a multidisciplinary team of health workers in the parish health department. Each parish provides a mix of preventive and curative services to a defined catchment population by using a combination of types I, II, and III health centers. The district is the basic operational level; at this level, the type III health center forms the base and the District Medical Officer is the designated team leader.

The type I health center is the simplest, and it is staffed by a midwife and two community health aides; it serves a population of 4,000–5,000. The type II health center has a catchment population of about 10,000–12,000 and provides doctor and dentist visits. The type III health center is the main provider of curative services, and it is where the doctor, nurse practitioner, and dentist are based. In the main parish towns, the parish office and the type III center are combined; this unit is designated as a type IV center. Large health centers (polyclinics) located in urban capitals have been designated as type V health centers—they provide specialist ambulatory services to large catchment populations in addition to basic primary health care services. A "satellite" health center receives periodic visits from staff from a "parent" center and extends services to underserved and remote populations.

In 1985–1986, the Government's hospital rationalization program converted five small acute care hospitals into primary health care facilities. Currently, there are 19

government acute care hospitals in addition to one university hospital, one mental hospital, and three chronic-care government hospitals. These hospitals (except for the mental hospital) are organized into ten hospital regions, and each region is administered by a hospital board selected by the Minister of Health every two years.

The hospitals are classified according to level of services and catchment population served. Type C hospitals are the basic district hospitals which interface with the primary health care system at the parish level. Inpatient and outpatient services are provided in general medicine and in child and maternity care. These hospitals also provide basic x-ray and laboratory services to hospital patients, to the primary health care services, and to both the public and private sectors.

Type B hospitals, usually situated in larger urban centers, provide inpatient and outpatient specialist services in, at least, general surgery, internal medicine, obstetrics and gynecology, and pediatrics. Because support services in most of these facilities have not been upgraded or maintained sufficiently, these institutions have not properly fulfilled the role as a second referral level in support of type C hospitals.

Type A hospitals, limited to Cornwall Regional Hospital in Montego Bay and the Kingston Regional complex which includes Kingston Public Hospital, Bustamante Hospital for Children, Victoria Jubilee Hospital, and the University Hospital, provide both secondary and tertiary care services for the whole island.

In addition, each hospital also provides primary care for the immediate catchment population. There are also chronic hospitals, one each for mental health, chest diseases, oncology, and physical rehabilitation.

Production of Services

In 1987, there were 2,421,800 primary care visits distributed as follows: 43.9% curative, 16.7% child health, 13.9% family planning, 10.2% home visits, 6.3% dental visits, 6.2% antenatal visits, and 2.9% postnatal visits. Throughout 1985–1987, the total number of visits and the visits by service remained relatively stable.

Between 1984 and 1987, the number of inpatient discharges and attendances at government hospitals decreased. In 1984 there were 147,437 discharges, dropping to 128,724 in 1986, and rising again to an estimated 133,019 in 1987. Outpatient attendances were 551,844 in 1984, 420,640 in 1986, and 545,074 in 1987. There were 530,879 casualty attendances in 1984, 383,608 in 1986, and 494,982 in 1987.

Two factors have influenced the decrease in hospital utilization during 1984–1986. Late in 1984, the Ministry of Health reintroduced user fees for hospital patients. Although modest in comparison with actual costs, these

undoubtedly influenced the number of attendances and discharges in 1985 and subsequent years. Second, during 1985–1986, the Ministry of Health converted five of the smaller hospitals into polyclinics and reduced the number of beds in several other hospitals. This particularly influenced the number of discharges in 1986, although there is evidence that, as planned, this workload had been taken up by other receiving hospitals in 1987.

Installed Capacity

In 1987, there were 361 government health centers: 191 type I, 87 type II, 78 type III, 3 type IV, and 2 type V. In addition, there are 10 family planning clinics, 18 school dental clinics, and 6 mobile clinics. The number of beds in public general hospitals was 5,678 in 1985, 5,472 in 1986, and 5,463 in 1987.

Health Services Technologies

The country's diagnostic and therapeutic services have suffered during this period from the loss of skilled manpower, poor maintenance, and lack of modern equipment.

A new central public health laboratory, constructed through a European Economic Community project, is expected to begin operating in early 1990; this project also will improve laboratory equipment in the hospitals. Some special services will remain centralized. A blood bank located next to the new laboratory provides national service with collection at its main center, in some rural hospitals, and through mobile units.

Basic x-ray services are not readily available at 25% of the hospitals; they provide services through visiting radiographers or refer patients to other hospitals. Main problems are lack of manpower and equipment failure. This service covers the health center network and accepts referrals from general practitioners. Two computer tomography machines are available, one at the University Hospital and the other in the private sector (also in Kingston). Government hospitals have limited access to the equipment at the University Hospital. Two units provide radiotherapy treatment in the island, and both need upgrading to meet increasing demand.

The pharmacy service has been severely affected by the loss of skilled manpower to the private sector; training and utilization of pharmacy technicians have helped somewhat, but this remains a major problem.

Financing of the Health Services

Health expenditure in Jamaica includes the allocation of resources to a broad range of providers and activities.

Providers include public hospitals and health centers, private practitioners, pharmacies, and laboratories; health care activities include delivery of hospital services, environmental control, health education, and training for health care professionals.

In nominal terms, total health expenditure grew from \$J268 million in 1981 (includes calendar year 1981 for private expenditure and fiscal year 1981–1982 for public expenditure) to \$J620 million in 1986. In real terms, however, expenditure decreased from \$J547 million in 1981 to \$J539 million in 1986 (constant 1985 dollars). The modest decline over this period masks greater fluctuations from year to year; total expenditure increased in 1982 and 1986, but fell in the other years. Thus, although total expenditure fell by only 1.3% between 1981 and 1986, it fell by 12% between 1982 and 1985.

Capital expenditure showed a dramatic decline in real terms (nearly 80%) from \$51.2 million in 1981 to \$10.5 million in 1985, but rebounded in 1986 to \$20.2 million, which was about its 1983 level. If capital is excluded and total recurrent health expenditure alone is considered, the 1986 level of \$520 million is 4.8% greater than that of 1981. However, given the large increase in 1982, there was a 3.6% drop in real recurrent expenditure between 1982 and 1986.

In real per capita terms, expenditure fell over the period, both including and excluding capital, although the decline is more marked when capital is included. The maximum per capita expenditure of \$267 occurred in 1982 and the minimum of \$223 in 1985 (a drop of 16%), before rising to \$231 in 1986.

In 1982, public sector expenditure accounted for about 68% of total health spending, but by 1986 this figure had fallen to about 55%. This decline occurred both because real public expenditure was falling and because private spending increased steadily in real terms after 1983. The increase in real private spending mitigated this decline to some extent, but it did not fully compensate for the drop in public expenditure.

Human Resources

Most of the country's health services are provided through the Government, which has 95% of the hospital beds and the capacity to employ 10,972 workers in established posts (1986); if staff at the Bellevue Mental Hospital and at the Government Chemist are added, the staff total reaches 12,000. Since health is labor intensive, health manpower is critical for the successful functioning of the health system. Consequently, 65% of the Ministry of Health's recurrent budget is allocated to health personnel. Of the total established posts, 63% are in hospital services, 26% in primary health care services, 3% in gen-

eral administration, and the rest are in the specialized units of the Ministry.

In 1987 the health personnel ratio per 100,000 population was 14.1 physicians, 70.6 registered nurses, 7.5 public health nurses, 36.0 assistant nurses, 20.0 midwives, 21.7 community health aides, 3.2 pharmacists, 5.2 pharmacy technicians, 2.3 dentists, and 5.9 dental nurses.

The following categories of personnel are trained in the country: doctors (5 years), nurses (3 years), midwives (2-year basic course in midwifery and 1-year post-basic), public health nurses (1 year), nurse practitioners (1 year), nurse anesthetists (18 months), radiographers (3 years), pharmacists (5 years), medical technologists (4 years), nutritionists (2 years), and public health inspectors (3 years).

HEALTH AND THE ENVIRONMENT

In 1987, the responsibility for domestic water supplies and sewerage was transferred from the Ministry of Public Utilities and Transport to the Ministry of Local Government. The population with potable water through house connections was 1,344,000 (57% of the total population) and through standpipes it was 336,000 (14.3%); the remainder, 675,400 (28.7%), received water from untreated sources such as springs and rainwater catchments.

Monitoring of drinking water quality indicates improvements: in 1985, 74% of the samples had a positive bacteriological reading, while in 1988, only 23% were positive. This is the result of major efforts, from the Government and PAHO, directed to the establishment of a drinking water quality monitoring network.

Of the total population, 16% has access to municipal sewerage systems, 50% is served with pit latrines, 28% uses septic tanks and percolation pits, and 6% does not have any excreta disposal system. Of the 102 treatment plants, 25 are in the metropolitan area; monitoring of these plants indicates that 38% are operating satisfactorily.

There are 25 solid waste dump sites; only 3 can be considered as landfills, and they are poorly managed. While garbage collection has improved dramatically through the years, especially in the Kingston metropolitan area, less attention is given to the disposal aspect. Consequently, leachates pollute aquifers, beaches, and streams.

Air pollution has not received appropriate attention. Neither skilled personnel nor regulations for the control of atmospheric pollution exist, although the Ministry of Health does have sampling stations. These monitoring stations were once established in Kingston, but monitoring was never fully implemented.

Visits to 531 industries indicate that only 366 (69%)

had satisfactory working environments. Lack of protective regulations and insufficient trained personnel are among the problems in this area. A study of blood lead pollution among battery factory workers found that 76% of the workers had levels above those recommended by WHO. Blood lead poisoning has been found in workers within the factory and also in people living in the surroundings, especially children. Forty-four percent of the

children in the preschool group were found with blood lead levels above WHO recommendations. Action is being undertaken to eliminate this problem.

All new housing subdivisions and developments are approved after suitable plans for sewage and solid waste collection and disposal are presented to the Ministry of Health. However, because of budget constraints construction inspection is not carried out.

MEXICO

GENERAL CONTEXT

Political, Economic, and Social Situation

The 1980s marked the end of the Mexican economy's accelerated growth and the beginning of a process of redefinition of productive, political, and social relations. In the course of the eighties, after a brief upturn associated with the oil boom, the Mexican economy entered a period of low productivity. As a result of the crisis, the standard of living for most of the population rapidly deteriorated. From 1982 to 1986, the gross domestic product (GDP) declined from \$Mex4.83 trillion to \$Mex4.73 trillion, and per capita GDP dropped from \$Mex66,210 to \$Mex59,390 (in 1980 pesos). Beginning in 1982 and 1983, the reductions in the GDP were associated with major price increases. In 1983, the economic policy implemented to combat inflation was aimed at reducing aggregate demand and offering a wide range of conditions to stimulate supply. A restrictive wage policy was established, and simultaneously price controls were cut back. According to preliminary calculations, in subsequent years a relative reduction in inflation was accompanied by a reduction in the purchasing power of the wages. In 1987 the economy began to grow again, but inflation also reached record levels.

In 1986 production declined in agriculture and livestock, mining, manufacturing, construction, and commerce. In the first two quarters of 1987 economic activity in agriculture and livestock, industry, and service activities also contracted. Despite this recession, unemployment in Mexico City declined to 4.4% in 1987.

The external debt, which in 1979 came to \$US36 billion, reached \$US100.50 billion by 1988. The exchange rate grew from \$Mex23 to \$US1 in 1979, to \$Mex2,230 in November 1987. Annual inflation, which was 26% in 1980, and which maintained values of around 100% up to 1987, was reduced to 51.7% in 1988 as a result of the Economic Solidarity Pact. The National Consumer Price Index increased 105% in 1986 and 159.2% in 1987, with a consequent deterioration of the purchasing power of wages. In March 1987, the cost of the basic market basket had increased 132.4% in relation to 1986, while the legal minimum wage in Mexico City rose only 84.8%.

Restrictions on public spending are accompanied by a

lack of commitment to establish a food and nutrition surveillance system. Nationwide, the only data on rural communities come from the medical units of the Mexican Social Security Institute's (IMSS) rural care system. These data show a decline in the prevalence of malnutrition in children under 5 years old, from 34.5% in 1985 to 27% in 1987, although this drop could be attributed to a bias in the served population. Studies carried out by the National Nutrition Institute in 1979, 1982, and 1986 in the northern mountains of the state of Oaxaca, one of the areas most seriously affected by malnutrition, show a persistent prevalence in preschool children that varies from 62% to 87%. The Institute observed a similar situation in the state of Chiapas.

Beginning in 1983 the Government redirected its food policy and established the National Food Program (PRONAL) to coordinate the different governmental and semipublic agencies involved in the food sector. In 1982-1984, PRONAL foresaw an 18% reduction of caloric intake for the low-income agricultural population and a 10% reduction for the population employed in other activities.

Surveys carried out by the National Consumer Institute and the National Nutrition Institute show that in 1988 the purchasing power of wages was 50% less than in 1980, and that families resorted to such strategies as taking additional wage-earning jobs or participating in the informal sector to increase the family income, spending less on more durable consumer goods, and buying poorer quality goods. In terms of food, this meant substituting chicken for beef or pork, white bread for pastries, and tortillas for white bread.

Demographic Characteristics

In 1988, the population was estimated at 82,700,000, with a population density of 35.6 inhabitants per km². Mexico's rapid population growth occurred from 1950 to 1970, when the population doubled. In the 1960s the population growth rate held at 3.5% per year. The National Population Council (CONAPO) notes that beginning in 1970 there has been a steady decline in the population growth rates; in 1988 the rate was estimated at 1.8%. In 1980, 43% of the population was under 15 years old, and only 3.4% was over 65 years of age.

In 1940, 2.3 million people lived in six cities of more than 100,000 inhabitants; in 1980, more than 32 million people lived in 52 cities of that size. In 1987, 68% of the population was urban and 32% rural, and much of the latter was scattered in small communities. The metropolitan area of Mexico City and 25 neighboring municipalities have a population of 18.7 million; Guadala-

jara, 2.8 million; Monterrey, 2.6 million; and Puebla, 1.4 million inhabitants. It is estimated that in 1986 the most populated states were the state of México, the Federal District, Veracruz, Jalisco, Puebla, Guanajuato, Michoacán, and Nuevo León (Table 1).

In 1973, the Government approved a population policy that encouraged control of population growth and

| Federal entity | Total | Males | Females |
|-----------------------|--------|--------|---------|
| Country total | 79,564 | 39,947 | 39,617 |
| Aguascalientes | 648 | 323 | 325 |
| North Baja California | 1,349 | 676 | 673 |
| South Baja California | 291 | 150 | 141 |
| Campeche | 553 | 280 | 273 |
| Chiapas | 2,435 | 1,246 | 1,189 |
| Chihuahua | 2,206 | 1,108 | 1,098 |
| Coahuila | 1,841 | 928 | 913 |
| Colima | 405 | 205 | 200 |
| Durango | 1,347 | 681 | 666 |
| Federal District | 10,052 | 4,938 | 5,114 |
| Guanajuato | 3,440 | 1,726 | 1,714 |
| Guerrero | 2,470 | 1,249 | 1,221 |
| Hidalgo | 1,771 | 905 | 866 |
| Jalisco | 5,049 | 2,508 | 2,541 |
| Mexico | 10,650 | 5,329 | 5,321 |
| Michoacán | 3,282 | 1,645 | 1,637 |
| Morelos | 1,194 | 599 | 595 |
| Nayarit | 825 | 420 | 405 |
| Nuevo León | 3,033 | 1,532 | 1,501 |
| Oaxaca | 2,609 | 1,320 | 1,289 |
| Puebla | 3,923 | 1,966 | 1,957 |
| Querétaro | 906 | 458 | 448 |
| Quintana Roo | 352 | 183 | 169 |
| San Luis Potosí | 1,952 | 987 | 965 |
| Sinaloa | 2,255 | 1,150 | 1,105 |
| Sonora | 1,744 | 887 | 857 |
| Tabasco | 1,252 | 638 | 614 |
| Tamaulipas | 2,208 | 1,105 | 1,103 |
| Tlaxcala | 644 | 327 | 317 |
| Veracruz | 6,389 | 3,225 | 3,164 |
| Yucatán | 1,254 | 635 | 619 |
| Zacatecas | 1,235 | 618 | 617 |

Source: National Institute of Statistics, Geography, and Information Science (INEGI) and CONAPO. Projections of the population of Mexico and of the federal entities, 1980-2010. Mexico City, 1985.

distribution; since then, specific activities have been carried out in this area. Overall fertility for women of child-bearing age (15–44 years old) fell from 6.76 per 1,000 live births in 1968 to 3.76 per 1,000 in 1986.

Interstate migrations have increased considerably. From 1960 to 1980 the number of migrants rose from 5 million to 11.6 million. The states of Baja California, Nuevo León, Tamaulipas, Morelos, and Quintana Roo attract many migrants and show migration rates as high as 7 per 1,000 population. It is estimated that approximately three million people live in irregular settlements and “lost cities” within the Federal District.

In 1980 there were 2.5 million Mexicans residing in the United States of America. According to the 1980 census, 269,000 persons stated that they had been born outside Mexico, and the current number of foreigners may be greater, due to the immigration of undocumented Central Americans, mainly Guatemalan and Salvadoran, in the 1980s.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

The underregistration of mortality is greater in rural areas and in the population under 5 years old. There is almost total coverage of deaths in the Federal District and in some northern states. The coverage of medical certification of deaths is relatively high, with a national average of 90.2% and variations from 61.6% to 99.0% in different states. However, the percentage of underregistration of infant mortality, estimated by indirect methods, was 19.7% in 1976.

Overall mortality has experienced a clear downward trend since the turn of the century, from 33 deaths per

1,000 population to approximately 6 per 1,000 for 1981–1987. According to data from the Secretariat of Health's General Bureau of Biostatistics, the infant mortality rate dropped from 68.5 per 1,000 live births in 1970 to 29.1 per 1,000 in 1984. However, infant mortality remains significant, as it is greater than mortality in all other age groups except for those 65 years and older.

Diarrhea and respiratory infections are the leading cause of death; however, chronic diseases (diabetes and cardiovascular diseases) and accidents are beginning to feature prominently in Mexico's new mortality profile (Table 2).

Accidents are the second leading cause of death in men, affecting them 3.8 times more than women. The three leading causes of death in the overall population are intestinal infections, pneumonias, and perinatal causes. The last were the leading cause of death among infants.

The intermediate causes of mortality for the overall population include chronic diseases such as diabetes, ischemic heart diseases, cirrhosis of the liver, and cerebrovascular diseases; the lowest ranking causes are motor vehicle traffic accidents and homicides. In men, motor vehicle traffic accidents and homicides are the fifth and sixth leading causes, respectively. For women, diabetes is the third leading cause, ahead of perinatal causes.

According to this breakdown, violent acts are not among the ten leading causes of death for women; however, if causes are ranked based on total years of potential life lost (YPLL), even the causes of death at an early age become more important, especially when the YPLL has a limit below 0. Thus, in terms of YPLL for 0 to 65 and for 0 to 70 years, intestinal infections, conditions originating in the perinatal period, and pneumonia rank among the leading causes. Chronic diseases, with the exception of cirrhosis of the liver, are replaced by violent acts, which rank at intermediate levels, along with disorders of fluids and electrolytes, septicemia, unspecified bronchitis, malnutrition, and tuberculosis. Diabetes ranks

| Cause | Total | | Males | | Females | |
|-----------------------------------|-------------------|-------------------|-------|-------|---------|-------|
| | Rate ^a | YPLL ^b | Rate | YPLL | Rate | YPLL |
| Infectious and parasitic diseases | 113.4 | 534.7 | 120.1 | 571.4 | 105.1 | 490.1 |
| Malignant neoplasms | 40.9 | 52.9 | 37.1 | 45.5 | 44.5 | 59.9 |
| Diseases of the heart | 67.9 | 65.6 | 67.5 | 71.4 | 67.9 | 59.1 |
| Accidents | 61.2 | 224.7 | 96.0 | 350.0 | 25.2 | 94.6 |

^aRate per 100,000 population.

^bYears of potential life lost per 10,000 population.

Source: Health Profiles Research Project, PAHO/Secretariat of Health, General Bureau of Epidemiology. Mexico City, February 1988.

in 14th place, while cerebrovascular disease and kidney infections are among the last five causes listed. During 1965–1970, mortality from diabetes was more important than mortality from other chronic and degenerative causes.

The YPLL from intestinal infections from 0 to 70 years is 7.3 times greater than that from cirrhosis; if this comparison is made with the YPLL from diabetes mellitus, the ratio becomes 14 to 1, which is an important fact for preventive health programs.

From 1985 to 1990, life expectancy was estimated at 72.2 years for women and 65.7 years for men. By the year 2000, it is estimated that life expectancy at birth will be 75 years for women and 68.3 years for men.

Health Situation of Specific Population Groups

Child Health

Infant mortality was 35 per 1,000 live births in 1981 and 30.1 per 1,000 in 1983. From 1983 to 1986, infant mortality declined approximately 29%. Congenital anomalies, infections, and birth traumas are among the leading causes of death. Congenital anomalies and conditions originating in the perinatal period accounted for 14% of deaths, while infections accounted for 36.9%, birth traumas for 26%, and protein-calorie malnutrition for 1.65%.

In 1983, neonatal mortality was 13.2 per 1,000 live births, and postneonatal mortality, 16.9 per 1,000; the rate of stillbirths was 11.0 per 1,000 live births. There are marked variations in infant mortality among the different states of Mexico (Table 3). Unfortunately, adequate knowledge of infant mortality has been limited by deficiencies in the registration of live births and deaths.

The death rate in children 1 to 4 years old fell from 274.0 per 100,000 in 1981 to 128.4 per 100,000 in 1986. In 1984, the five leading causes of death, in order of importance, were intestinal infectious diseases and accidents in general, pneumonia, bronchitis, emphysema and asthma, and nutritional deficiencies. In 1983, almost one-fourth of mortality registered in children under 5 years old was linked to acute respiratory infections. In 1984, pneumonia constituted the second leading cause of death in children under 1 year old, and the third leading cause in children 1 to 4 years old. The sample of morbidity attended to in outpatient consultations of the Secretariat of Health in the first quarter of 1988 indicates that diseases of the upper respiratory tract are the leading cause of consultation, and that 45.1% of all consultations in cases of diseases of the upper respiratory tract are for children under 5 years old.

Although knowledge of the population's nutritional characteristics is only partial, it is estimated that 30% to 70% of children under 5 years old suffer from some degree of malnutrition. A major cause of malnutrition in children is the failure to continue breast-feeding. In Mexico City, only 18% to 31% of mothers in marginal areas breast-feed their children at 3 months of age. In the south-eastern states, malnutrition associated with parasites is so significant that programs for parasite control are a health care priority.

Immunization against poliomyelitis effectively reduced the disease's incidence, but irregular vaccination led to unexpected outbreaks. In 1985, 148 cases were reported; in 1986, when the National Polio Vaccination Days were launched, only 65 confirmed cases were registered. In 1987, 81 cases were confirmed. In 1988, 196 probable cases of poliomyelitis were registered, 21 of which were confirmed as of 27 March 1989; in 38% of these cases, the subjects had received three or more doses of OPV, and 66% were under 5 years old. There were 12 deaths. In 1987, there were 31 reported cases of diphtheria. Tetanus most affected the age group from 0 to 28 days (28.8% of the cases), followed by the age group 15 to 44 years old, with 23.7%; 54.2% had not been vaccinated. In 1987, 914 cases of whooping cough were reported, 49.8% of whom were in the program's target age group (children under 5 years old); of these, 64.2% had not received DPT.

It is estimated that there are 90,000 annual episodes of respiratory infection (pneumonia, bronchitis, bronchiolitis, laryngitis), 60,000 cases of otitis, and 1,000 to 2,000 episodes of encephalitis. In 1982, 544 deaths due to measles were registered, with a death rate of 0.7 per 1,000 population. Vaccination of newborns with BCG has intensified in recent years, and in 1988 perhaps over 80% of all newborns were vaccinated. Mortality from tuberculosis in children has been substantially reduced.

Diarrheal diseases are one of Mexico's main public health problems. Together with respiratory infections, they are the leading cause of disease and death, despite their steady decline in all age groups over the last 55 years. It is estimated that they are the leading cause of consultation in many health institutions. Intestinal amebiasis is one of the most frequent parasitic diseases and is endemic nationwide. The most common clinical form is intestinal, which predominates in children 5 to 10 years old who come from poor families, have low levels of schooling, and live in unsanitary conditions.

The school-age population (5–14 years old) is estimated to have constituted 26.4% of the total population in 1986. The specific death rate fell from 65.0 per 100,000 population in 1982 to 59.3 per 100,000 in 1984. Mortality is greater in males than in females, which is partly explained by the fact that males enter the work force early.

| Federal entity | Total | Males | Females |
|----------------------------|-------|-------|---------|
| Country total ^a | 29.16 | 31.78 | 26.32 |
| Aguascalientes | 36.24 | 38.44 | 26.32 |
| North Baja California | 24.11 | 26.72 | 20.90 |
| South Baja California | 26.05 | 29.05 | 23.01 |
| Campeche | 27.48 | 29.15 | 26.64 |
| Chiapas | 27.82 | 30.14 | 24.99 |
| Chihuahua | 26.27 | 27.96 | 22.28 |
| Coahuila | 19.59 | 21.16 | 17.61 |
| Colima | 28.37 | 32.84 | 22.64 |
| Durango | 12.69 | 13.09 | 11.38 |
| Federal District | 30.25 | 33.68 | 26.64 |
| Guanajuato | 44.06 | 48.16 | 39.56 |
| Guerrero | 15.63 | 17.29 | 13.43 |
| Hidalgo | 30.47 | 32.81 | 27.84 |
| Jalisco | 31.99 | 34.04 | 29.42 |
| México | 47.46 | 51.93 | 42.30 |
| Michoacán | 26.03 | 28.04 | 23.44 |
| Morelos | 18.22 | 20.43 | 15.79 |
| Nayarit | 14.40 | 16.81 | 11.82 |
| Nuevo León | 22.77 | 24.96 | 20.49 |
| Oaxaca | 28.90 | 31.37 | 26.13 |
| Puebla | 39.27 | 42.10 | 35.19 |
| Querétaro | 36.00 | 37.49 | 33.94 |
| Quintana Roo | 26.35 | 26.86 | 24.98 |
| San Luis Potosí | 34.25 | 35.03 | 32.73 |
| Sinaloa | 10.69 | 11.69 | 9.48 |
| Sonora | 23.76 | 24.95 | 22.00 |
| Tabasco | 24.64 | 27.42 | 21.78 |
| Tamaulipas | 15.89 | 17.68 | 14.01 |
| Tlaxcala | 47.95 | 54.13 | 41.60 |
| Veracruz | 17.18 | 19.18 | 14.94 |
| Yucatán | 24.60 | 26.75 | 22.18 |
| Zacatecas | 26.83 | 28.84 | 24.49 |

^aInfant mortality per 1,000 live births registered that year.

Source: INEGI and Secretariat of Programming and Budget. Cuaderno No. 7, Information on the Health Sector. Mexico City, 1989.

In 1984, intestinal infections, accidents in general, motor vehicle traffic accidents, pneumonia, and drownings and accidental submersions were the leading causes of death. The most common causes of consultation in the Secretariat's services are upper respiratory infections, diarrhea, and other infectious and parasitic diseases. Only 17% of adolescent consultations were preventive.

Various surveys (CONAPO, 1981, and Centers for Adolescent Orientation and the Mexican Association for Demographic Research, 1985) show that 12% of live births nationwide were to mothers 15 to 19 years old, and that 33% of pregnancies in adolescents in Mexico City were premarital. Adolescent pregnancies are on the rise, due to the limited coverage of health programs for

this age group and to the lack of orientation and information on sex education in the family and at school.

Health of Adolescents and Adults

The adult population represents 59.5% of the total population; 49.9% is male and 50.1% is female. In 1984, in the age group 15 to 24 years old the ratio of male to female deaths was 2.4:1.

Tuberculosis is common in all regions of the country, but its incidence is greater in the states of Chiapas, Veracruz, Tamaulipas, Oaxaca, and Guerrero, and in the coastal states of the Pacific and the Sea of Cortez. In 1987, the reported incidence of pulmonary tuberculosis cases nationwide was 26.5 per 100,000, which accounts for only 40% to 50% of real incidence. There has been a reduction of the disease in young adults, but rates increase progressively with age.

In 1985, the Mexican Centers for Youth Integration attended to 6,000 cases of drug abuse, 91.6% of which involved males. The age group 15 to 19 years old was the most affected, followed by the age groups 20 to 24 years old and 25 to 29 years old. The most commonly used drug was marijuana. The Federal District had the highest frequency of consumption, followed by Jalisco and the state of Mexico. Inhalation of solvents was the second leading cause of drug abuse, followed by alcohol, depressants, stimulants, narcotics, and hallucinogenics.

Some degree or type of disability is found in 7% of the population; 35% of those affected are in the economically active age. It is estimated that by the year 2000, 14 million people will have some physical or mental disability. A 1982 national survey on disability found disability rates of 2.9% in the overall population. The frequency was greater among males (3.7%) than among females (2.2%). The ten leading sequelae found were articular diseases, epilepsy, blindness, Down's syndrome, hemiplegia, congenital anomalies, mutism, poliomyelitis sequelae, mental deficiency, and deafness. Furthermore, from 1975 to 1982, 40,938 cases of disability were reported to the Secretariat of Health, 41.9% of which were in females.

Violent deaths and accidents constitute a major cause of hospitalization, disability, and death in Mexico. In the states of North Baja California, Colima, Hidalgo, Michoacán, Nayarit, Puebla, Querétaro, Sinaloa, Sonora, and Tlaxcala, there were rates greater than 70 per 100,000 population. In a recent study on mortality due to accidents, motor vehicle traffic accidents showed the highest rate (20.3 per 100,000 inhabitants). Accident rates are higher in persons 45 years old or older; percentages are greater in the age groups 15 to 24 years old (20.7%) and 25 to 44 years old (31.6%).

During the 1980–1983 period, maternal mortality declined 7.1%. In 1983, the maternal death rates per 1,000

live births were 0.43 in Sinaloa, 0.35 in North and South Baja California, 0.21 in Colima, and 0.13 in Nuevo León. The states with the highest maternal mortality rates are Oaxaca (1.61), Puebla (1.52), Campeche (1.18), Hidalgo (1.19), and Chiapas (1.11).

From 1983 to 1985, mortality in women served by the IMSS was due mainly to toxemias, complications in childbirth, abortion, and hemorrhages. Induced and clandestine abortions are a cause of maternal death whose dimensions have not been accurately determined. The more than 80% of maternal deaths that are due to direct obstetrical causes are avoidable. Contraceptive services were officially begun in Mexico in 1974. In 1983 their reach was expanded through the Interinstitutional Program of Family Planning.

Pregnant women receive an average of 2.3 consultations per pregnancy. In 1982, estimates of deliveries without medical care ranged from 67.9% in the state of Chiapas to 13.1% in South Baja California. The national average was 47.1%. In 1987, prenatal care coverage was 62%, while coverage of deliveries was 38%. Data obtained through the 1987 National Health Survey indicated the participation of lay midwives in 14% of deliveries in Mexico; this illustrates the limited impact of the programs for lay midwives.

It is estimated that the underregistration of suicides is high. Available information indicates that almost twice as many women as men attempt suicide, but that there are more male than female suicides. In 1984, of a total of 70 suicide attempts, 43 were among women; on the other hand, of 1,127 suicides, 957 were among males. Total suicides rose from 672 in 1980 to 1,124 in 1984. In 1980–1984, 32.3% of the suicides among women and 24.5% among men were in persons under 25 years old.

Since alcoholism carries a greater social stigma among women, it is more difficult to recognize and treat it. In 1984, cirrhosis and other chronic diseases of the liver were among the ten leading causes of mortality in women 25 to 64 years old. Women account for approximately 9% of the patients attended to for drug addiction problems at the Center for Youth Integration.

The utilization of outpatient and hospitalization health services is greater among women. In the Ongoing Survey on Morbidity conducted by the Secretariat of Health, women account for 66% of all consultations. The most marked differences among sexes are in the age groups 15 to 29 years old and 30 to 49 years old, due to the demand both for services during pregnancy and for family planning services. The demand for prenatal care is the leading cause of outpatient consultation.

In the health institutions of the official sector, the three leading causes of hospital discharges are normal delivery, direct obstetrical causes, and abortion. In the Federal District medical units and in the private establishments nationwide, normal delivery ranks as the leading cause of

hospital discharges (31.9%), obstetrical causes rank fourth (16.2%), and abortion ranks fifth (6.3%). Women account for 71.4% to 75% of discharges from the IMSS institutions, the Institute for Social Security and Services for State Workers (ISSSTE), and the Secretariat of Health; for 58.5% in the units of the Federal District Department (DDF); and for 64.8% in private establishments. Abortions as a percentage of discharges of women are lowest in the private establishments (4.3%) and highest in the Secretariat of Health establishments (8.6%).

According to the 1987 National Health Survey, the prevalence of chronic diseases and disabilities was higher in women (9.2%) than in men (5.8%). Although the highest prevalence rates of acute diseases were between 12 months and 34 years old, the prevalence rates for chronic diseases and disabilities rose considerably beginning at age 35.

In 1988, the country's work force was estimated at 28 million people; information is available only on the health situation of those workers affiliated with the IMSS. In 1984, 6,677,420 persons were insured through the IMSS. Industrial development was not coupled with adequate safety and sanitary conditions or with training of human resources for their control and surveillance.

From 1980 to 1984, work-related accidents declined 46%; on the other hand, accidents on the way to work increased 29.9%. Occupational diseases increased from 2,195 to 2,527 cases in the same period. The IMSS reported that mortality from occupational risks among its beneficiaries showed a sustained downward trend, from 1,652 in 1981 to 1,286 in 1986. The frequency of injuries caused by occupational risks, such as wounds, fractures, and traumatism, suggests the need to strengthen the preventive and legal measures aimed at reducing the incidence of these problems in workers.

Available information on cardiovascular and hypertensive diseases is limited. Some studies point out that hypertension affects 10% to 29.5% of the adult population, and a high proportion of the adult population has consistently been reported to be overweight or obese. Surveys on smoking, although hardly comparable, found that 17% of the general population smokes, and that 23% of students and 44% of physicians smoke. In 1984, cardiovascular diseases were the leading cause of death, with a rate of 61 per 100,000 population. In the last two decades the mortality rate from cardiovascular diseases has remained relatively stable, at approximately 70 per 100,000, but its proportion of overall mortality has risen steadily.

The establishment of a vigorous program to diagnose diabetes resulted in an increase in registered morbidity in recent years. Prior knowledge of this factor led to an increase in mortality attributed to diabetes, from 17.7 per 100,000 population in 1976 to 26.8 per 100,000 in 1985 (an increase of 51.4%).

A lack of standardized or representative information makes it impossible to precisely determine the magnitude and trends of morbidity from cancer. In 1984 there were 31,881 deaths from cancer, with a death rate of 41.7 per 100,000 population; neoplasms are the fourth leading cause of overall mortality.

In women 35 to 54 years old, cancer of the cervix is the leading cause of death up to 45 years old and the second leading cause from 45 to 54 years old. In men, the lung and stomach are the most frequent sites of neoplasms. In both sexes, in the age group 55 to 64 years old, neoplasm of the lung is the most frequent cause of mortality, along with neoplasms of the cervix and of the stomach. In 1984, the death rate from malignant neoplasms was 45.7 per 100,000 for women and 37.5 per 100,000 for men. The early detection of cancer of the cervix has been vigorously promoted in the country. From 1974 to 1976, an average of 130,000 cervical cytologies were conducted each year, and from 1983 to 1988, 600,000.

In 1987, syphilis and gonorrhea together were the sixth leading communicable disease among diseases requiring notification. Syphilis has gradually declined, falling to 6,687 cases, with a rate of 8.5 per 100,000 population in 1987. The states with the highest rates were North Baja California (52.0), Nuevo León (25.5), Chihuahua (23.3), and Colima (20.4). Mortality from syphilis also declined considerably, from 458 deaths in 1972 (0.8 per 100,000 population) to 200 in 1984 (0.1 per 100,000); the rate held steady up to 1987. That same year 28,125 cases of gonorrhea were reported, the most affected states being South Baja California (156.1), Quintana Roo (87.7), Colima (78.9), Nayarit (69.8), and Aguascalientes (60.5). The age groups between 15 and 44 years old are those most affected by these diseases. There has also been a slight predominance in males, with a proportion of 1.2:1 for syphilis and 1.3:1 for gonorrhea.

Health of the Elderly

In 1980, the population 60 years old and older came to 4,142,916 (6.1% of the total). By 1990, this population is estimated at 6,900,000, and by the year 2000 it is projected to climb to 10,000,000; in other words, in 20 years it will have increased by a factor of 2.5. Among those over 60 years old living in precarious conditions, the number of women is higher than men. Deficiencies in education and a lack of social security coverage for many of the women engaged in unremunerated domestic work are indicators of this group's vulnerability. The death rate due to tuberculosis in the group over 65 years old is 83.3 per 100,000. The death rates from the following causes are higher for women: diseases of the circulatory system, neoplasms, glandular diseases, and nutritional and metabolic diseases.

The epidemiological profile of the group 65 years old and older includes diseases of the heart and cerebrovascular diseases, as well as deaths caused by pneumonia, infectious diseases, and intestinal diseases. The proportion of deaths caused by chronic degenerative diseases is on the rise. In the early 1980s the growing importance of chronic diseases in adults was acknowledged, and in 1984 departments or normative units were established to formulate and begin to implement programs for the control of cardiovascular and hypertensive diseases, diabetes, and neoplasms. Working groups to establish programs to control addictions, alcoholism, and smoking also were formed. The program to control cancer of the cervix is long-standing in Mexico.

Problems Affecting the General Population

From 1981, when the first case of acquired immunodeficiency syndrome was reported in Mexico, to December 1988, 2,013 cases had been reported. Of these, 33.6% were in the Federal District and 24.5% were in the west-central region. Of the 1,465 cases in adults, 53.9% were in male homosexuals. The disease was acquired by blood transfusion in 219 cases and by intravenous drug use in 17 cases. In 1986, the National Committee for AIDS Prevention (CONASIDA) was established, and investigation of specific antibodies in blood donors was made compulsory. The sale of blood was prohibited in 1987.

In 1964, *Aedes aegypti* was eradicated in Mexico, but in 1965 a reinfestation occurred along the northern and southern borders. In 1988, 6,673 cases of classic dengue had been reported in the country, with the greatest number of cases registered in the states of Jalisco (2,385), Guerrero (771), Campeche (641), and Sinaloa (451).

The 1980–1988 period was characterized by a marked increase in cases of malaria. In 1988 the states of Oaxaca, Chiapas, and Guerrero accounted for approximately 56% of the 112,314 reported cases (preliminary data), followed by Michoacán, Sinaloa, Veracruz, Campeche, Nayarit, Puebla, Tabasco, Quintana Roo, Colima, Morelos, and Yucatán. The problem is concentrated along the Pacific Coast and in some areas of the Yucatán Peninsula. Internal migration (temporary workers) and external migration, especially over the southern border, aggravate the problem. To date, the parasites have not developed a resistance to antimalarial drugs, and the *Plasmodium falciparum* strains are not resistant to chloroquine. The experience points to technical and operational shortcomings in conventional measures.

Leprosy is decreasing, and it is focused in ten states that account for 80% of the national prevalence. Two states (Sinaloa and Colima) have rates that exceed 1 per 1,000 population. More than 16,000 patients have been identified and are in treatment; of these, 60% have lep-

romatous forms. In 1987, 365 cases were diagnosed (0.40 per 100,000 population), representing a greater decline than expected. This reduction and the high frequency of disabilities (more than 60%) in the diagnosed cases illustrate the limitations involved in the identification of cases with suspicious dermatological symptoms and the diagnosis of leprosy. The national control program aims at strengthening activities to integrate leprosy control into the first level of care by training physicians, making better use of diagnostic laboratories, and ensuring adequate treatment for all cases.

Dental caries affects 48% of children under 5 years old and up to 93% of children under 15 years old; it is the most important cause of tooth loss up to age 35. Periodontal disease is found in 9% of children 10 to 15 years old, in 10% to 30% of the population 10 to 35 years old, and in 97% of all persons over 50 years old. The Health Institute has designed a Comprehensive Oral Health Program (1986–1989) that includes education, prevention, and timely care of the leading oral problems. A dental care system based on simple technology has been implemented with the participation of auxiliary personnel.

Cysticercosis and taeniasis appear to be diminishing, according to observations of hogs killed at the slaughterhouses; however, these diseases are still common in hogs bred and slaughtered in the countryside. In 1980–1981, the national average rate of positivity was 1.55%; the figure reached 10% in Michoacán and in Ocampo, state of Guanajuato. At the main Mexico City slaughterhouse, it declined to 0.13% in 1980 and 0.16% in 1981.

From 1978 to 1982, brucellosis caused 163 deaths, although it is assumed that underregistration is significant. The states with the most cases were Querétaro, Coahuila, Guanajuato, and Nuevo León. It is known that from 1960 to 1986 unpasteurized milk accounted for 49% of total production and national consumption. This milk bypasses sanitary controls; never reaches pasteurizing plants; and is consumed by lower-income population groups, which attribute greater nutritive properties to it.

In 1980–1988, 632 cases of human rabies were reported; in 1988 there were 72 cases. In 1988, Mexico had nearly 50% of the cases of human rabies in the Americas; although most cases occurred in small cities, many were registered in large cities. The number of vaccinated dogs increases each year, but an immunological barrier in the canine population of the endemic areas could not be established.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

The health policy's broad goals are to achieve greater coverage of the health services, to improve the health

status of the population, to help reach a balanced population growth, to promote protection of the population with limited resources, to consolidate a national health system, to continue to decentralize the health systems, to bring together the efforts of all sectors that participate in health, to promote innovative ways to expand coverage, to strengthen the primary health care concept, to promote scientific research and manpower training, to rehabilitate and modernize the infrastructure, and to redistribute financial resources.

Characteristics of the Health Services Systems

The basic purpose of the National Health Program is to improve health through the establishment and consolidation of the National Health System. Its general objectives are geared to high-quality and caring medical attention, disease prevention and control, health promotion, sanitary and environmental control, harmonious population growth, social welfare, and extension of health services coverage. Its general strategies aim at the further development and strengthening of sectorization, decentralization, modernization, intersectoral coordination, and community participation. Additional specific strategies include the strengthening of local health systems, the operational implementation of a health care model, and the development of primary care.

Priority programs include medical care, maternal and child care, mental health, disease and accident prevention and control, health education and promotion, nutrition, occupational health, prevention and control of addictions, community surveillance and control, basic sanitation, environmental health, family planning and social welfare, research, training and development of human resources, information, and health inputs.

Regarding decentralization, 14 of the 31 Mexican states have already undergone program coordination and organic integration, and have constituted themselves into state health bodies. In some states, this effort has reached the municipal level. Decentralized states are responsible for using all the resources in their territory to offer health care to the uninsured population; the population covered by any social security plan is considered to be insured. Social security resources remain under the pre-existing administrative system.

The process of decentralization acknowledges three areas of responsibility in health management: local (jurisdiction of the municipal councils, local representative powers, or local legislators), federal, and state. The general health law transfers responsibility for medical care, public health, and social welfare to the states under the general coordination of the Secretariat of Health. Within a framework established by the central Government, fed-

eral, state, and local governments hold consultation meetings with specific groups that work directly on well-defined problems.

The local health systems are organized according to health jurisdictions. These jurisdictions have both a technical and administrative management level with a varied structure in terms of functions and of administrative and staff organization, and an operational level composed of first level of care units in all the jurisdictions and second level of care hospitals in some jurisdictions. In general, the hospital level is administratively accountable to the state level, rather than to the jurisdictions. The health jurisdictions may encompass one or several municipalities, and in some cases cover only portions of municipalities; their size ranges from 2,000 km² to 56,000 km². In the jurisdictions of the decentralized states, the total population varies widely, from 100,000 to more than 1,000,000 inhabitants.

However, the health structure has not been able to keep pace with population growth. Furthermore, there are still some five million people without access to any type of service. One of the main reasons for this inaccessibility of service is the fact that much of this population is distributed in 123,169 small localities having fewer than 2,500 inhabitants (according to the 1980 census). At the other extreme, there is a great concentration of population in the marginal areas of large cities; these persons saturate the services and prevent them from meeting this population's needs. A major effort has been made to create primary care units and to develop special structures for covering the marginal population.

Production of Services

It is estimated that 53% of the population is covered by social security and 5% by private services; the remaining 42% represents the uninsured population. In 1988, the insured population received 74% of medical consultations, and for each hospital discharge in the uninsured population there were three discharges in the insured population. The insured population received 1.5 times less dental care than the uninsured population. A total of 0.93 consultations per person were registered in the uninsured population, and 2.18 in the insured population; there were 0.22 odontological consultations per person in the uninsured population and 0.1 per person in the insured population.

Of the 2,986,850 hospital discharges registered in 1986, there were 2.2 discharges per 100 population in the uninsured population and 5.4 per 100 in the insured population. Total hospital discharges produced an overall average stay of 4.5 days per discharge; in the uninsured population the average stay was 1.2 days per discharge,

and in the insured population it was 5.0 days per discharge.

Installed Capacity

In 1986 there were 10,090 units for outpatient consultations: 75.9% serve the uninsured population and the rest serve the insured population. Of a total of 28,727 hospital consulting rooms and outpatient services, 49.4% serve the uninsured population and 50.6% serve the insured population. There are 805 hospital units, 30.6% of which serve the uninsured population and 69.4%, the insured population. These units have 60,099 hospital beds, 38.3% of which serve the uninsured population and 61.7%, the insured population. There are 1,638 operating rooms, 36.9% of which serve the uninsured population and 63.1%, the insured population.

Financing of the Health Services

The financing of federal institutions that serve the uninsured population (Secretariat of Health, Comprehensive Family Development (DIF) IMSS—COPLAMAR, Medical Services of the Federal District Department, and state governments) is based primarily on the contribution of governmental resources through the national budget. Recovery quotas, payments, and contributions of the user population account for a small part of total financing; in 1986, these funds accounted for only 4.5% in the Secretariat of Health. Table 4 shows the relative weight of the various health care entities in terms of public financing.

| Institution | 1985 | 1986 | 1987 |
|---------------------------------|-------|-------|-------|
| Total | 100.0 | 100.0 | 100.0 |
| Secretariat of Health | 69.4 | 74.3 | 74.9 |
| DIF | 3.6 | 4.6 | 2.8 |
| IMSS-COPLAMAR | 10.6 | 7.5 | 7.4 |
| State governments | 10.5 | 8.1 | 7.5 |
| DDF medical services | 5.9 | 5.5 | 7.4 |
| Federal resources to the states | 41.7 | 51.5 | 46.3 |

Source: Presidency of the Republic, Government Report, Secretariat of Programming and Budget, Accounts of the National Treasury. Direct state information.

From 1982 to 1986, the percentages of employer and worker contributions increased to 7% and 3%, respectively, while the state and other sources of contributions have significantly dropped, by approximately 27%. Table 5 shows the financing of state services and Federal District services for the uninsured population, by source of funds.

The analysis of this information is particularly important, since it covers the period when the responsibility for providing health care to the states' uninsured population began to be decentralized. Although the Federal Government increased its contribution by 23.9% in 1983–1987, the states increased theirs by 55.1% in the same period. In 1983, for every peso contributed by the states and the Federal District Department, the Federal Government contributed 3.9; by 1987, the federal contribution had dropped to 3.1, illustrating the greater financial commitment made by the states to health care.

Table 6 shows an analysis of health expenditure for 1982–1987, and its relationship to the GDP and to the Federal Government's program budget.

While the GDP fell 0.8% from 1982 to 1987 and the Federal Government's program budget dropped 12.5%, health sector spending increased 15.3%, with 5.6% corresponding to the public health subsector, 13.8% to social security, and 55.1% to state governments and the Federal District Department. Expenditure during the period came to 2.22% of the GDP, fluctuating from 2.09% in 1982 to 2.43% in 1987. The public health subsector's share decreased, from 25.9% in 1982 to 23.7% in 1987, with an overall share of 24.5% for the period. This is due mostly to the decentralization process begun in the 1982–1987 period.

An analysis of health expenditures by level of care from 1982 to 1987 shows that expenditures at the first level of care increased at an average annual rate of 5.1%, a far greater growth than that of sectoral expenditure and even of Secretariat of Health expenditures. Expenditure at the second level of care fell 1.9% annually, with the largest share of this reduction borne by the institutions that serve the uninsured population. At the third level of care, the reduction in expenditure was equivalent to an average rate of reduction in institutions that serve the uninsured population. By contrast, IMSS spending rose at an average rate of 4.1%.

The population increased 11%, public spending rose 15.3%, and per capita spending grew 3.8%. If this analysis is adjusted for sectoral expenditure (excluding that of the states and the Federal District Department) and for the population covered, the per capita expenditure for 1983–1987 shows a significant cumulative drop of 8.1% for 1984–1985 and a slight recovery of 1.1% for 1986–1987. Public health subsector expenditures increased significantly during the period, even though the total uninsured population showed a cumulative decline of

| Year | Total | Federal | | States and Federal District | | State/federal ratio |
|------|--------|---------|------|-----------------------------|------|---------------------|
| | | Total | % | Total | % | |
| 1983 | 15,223 | 12,182 | 79.6 | 3,111 | 20.4 | 1:3.9 |
| 1984 | 16,119 | 13,440 | 77.3 | 3,656 | 27.7 | 1:3.4 |
| 1985 | 18,736 | 13,440 | 71.7 | 5,296 | 28.3 | 1:2.5 |
| 1986 | 20,577 | 16,275 | 75.7 | 4,302 | 20.9 | 1:3.8 |
| 1987 | 19,837 | 15,013 | 75.7 | 4,824 | 24.3 | 1:3.1 |

Source: Secretariat of Health, World Bank, and PAHO. El enfoque de la salud como sector social y económico: gasto y financiamiento para la atención de la salud de México (Health as a social and economic sector: expenditures and financing of health care in Mexico), Mexico City, 1988.

| Year | Total GDP | Total public spending | | Health spending | | | |
|------|-----------|-----------------------|----------|-----------------|----------------------|----------|---------------------|
| | | Total | % of GDP | Total | % of public spending | % of GDP | Per capita spending |
| 1982 | 4,831,689 | 1,285,932 | 26.6 | 101,031 | 7.8 | 2.09 | 1,783 |
| 1983 | 4,628,937 | 1,264,174 | 27.3 | 101,736 | 8.0 | 2.20 | 1,362 |
| 1984 | 4,796,937 | 1,317,421 | 27.5 | 102,524 | 7.8 | 2.14 | 1,343 |
| 1985 | 4,919,905 | 1,296,848 | 26.3 | 107,569 | 8.3 | 2.19 | 1,380 |
| 1986 | 4,725,277 | 1,125,519 | 23.8 | 109,280 | 9.7 | 2.31 | 1,374 |
| 1987 | 4,792,936 | ... | ... | 116,469 | ... | 2.43 | 1,435 |

Source: Secretariat of Health, World Bank, and PAHO. El enfoque de la salud como sector social y económico: gasto y financiamiento para la atención de la salud de México (Health as a social and economic sector: expenditures and financing of health care in Mexico), Mexico City, 1988.

10.2%. On the other hand, although the total uninsured population decreased, mainly due to its incorporation into the regular social security system, coverage did increase, along with a cumulative increase of 10.1% in per capita expenditures of the uninsured population that has coverage. The private subsector absorbed a considerable share of financial resources for health in the period, even though this share dropped from 45.2% in 1982 to 40.5% in 1987.

Human Resources

The allocation of human resources to the uninsured and insured populations in 1986 is shown in Table 7. A study conducted in 1985 on the patterns of employment among physicians in Mexico's 16 main units found that

they include more than 75% of the country's physicians (102,300), more than 80,000 of whom are active or available in the labor market. The study revealed that 68.1% of the physicians are between 30 and 40 years old, and that 79.7% are men. Of the total, 55.7% have not pursued graduate studies, 40.2% have done residencies, 3.9% have master's degrees, and 0.2% have doctorates.

Approximately 36.1% of all physicians work in private practice, 35.4% work in social security, and 20.1% work in institutions that serve the uninsured population. A total of 34.7% of all physicians work in the first level of care, 45.7% in the second or third levels of care, and 11.2% in activities unrelated to medicine.

In general, the uninsured population has more support resources for diagnosis, except for x-ray facilities. This difference is greater in terms of delivery rooms, 81.8% of which serve the uninsured population (Table 8).

| Type of resource | Total | Uninsured population | | | Insured population | | |
|--|---------|----------------------|------|--------------------------------|--------------------|------|--------------------------------|
| | | No. | % | Resources per 1,000 population | No. | % | Resources per 1,000 population |
| Physicians in contact with patient | 64,616 | 25,136 | 38.9 | 0.76 | 39,480 | 61.1 | 0.94 |
| Physicians not in contact with patient | 9,745 | 3,469 | 35.6 | — | 6,276 | 64.4 | — |
| Paramedics | 151,171 | 48,375 | 32.0 | 1.46 | 102,796 | 68.0 | 2.45 |
| Nurses | 109,804 | 37,443 | 34.1 | 1.13 | 72,362 | 65.9 | 1.73 |
| Other staff | 110,036 | 35,321 | 32.1 | 1.06 | 74,715 | 67.9 | 1.78 |

Source: INEGI and Secretariat of Programming and Budget. Boletín de Información Estadística (Bulletin of Statistical Information) No. 6. Mexico City, 1987.

| Type of resource | Total | Uninsured population (%) | Insured population (%) |
|------------------|-------|--------------------------|------------------------|
| Laboratories | 1,115 | 54.8 | 45.2 |
| X-ray facilities | 1,648 | 41.7 | 58.3 |
| Delivery rooms | 3,579 | 81.8 | 18.2 |
| Blood banks | 126 | 53.2 | 46.8 |

Source: INEGI and Secretariat of Programming and Budget. Boletín de Información Estadística (Bulletin of Statistical Information) No. 6. Mexico City, 1987.

HEALTH AND THE ENVIRONMENT

The country's rapid process of urbanization will affect how drinking water and sewerage services will be provided in the future: while these services are extremely important, it is becoming increasingly difficult to meet the growing demand for water in urban centers due to social, technical, and economic problems. Water supply is inadequate in terms of the overall population's distribution. The problem is more serious in the Federal District, where average annual supply is estimated at approximately 400 million m³ and where the needs of some 11 million inhabitants have not been met.

In 1980, 61% of the population had household water connections and 37% had sewerage services. Currently, of the 80 million inhabitants, at least 30 million do not have household water connections and 50 million do not

have sewerage services. Many of those who have household water connections have deficient service. The negative repercussions on health are serious; since 1978, diseases related to the ingestion of contaminated water and food have been the third leading cause of death in the country.

The cost of services is socially unjust: while an urban dweller with a household connection in 1987 paid \$Mex100 per m³, those who live in the city's marginal areas or in the countryside paid \$Mex200 for a 20-liter water container without any quality assurance.

The water utilities' resources are so limited that even in the best circumstances they can cover only their regular expenditures, neglecting maintenance and expansion of the systems. It is estimated that water leaks and administrative problems are responsible for the fact that for every 100 liters of drinking water produced, only 60 reach the users, only 40 are invoiced, and payment is collected for only 30.

Overall water quality is considered acceptable in only 19 states or federal divisions. In the state of Hidalgo, water is highly contaminated by the Valley of Mexico's domestic and industrial waste, which contains suspended solids, alkaloids, sulfates, nitrates, and chlorides. The main pollution problems are located in the basin of the Valley of Mexico and in the basin of the Lerma and Tula rivers. There are also serious problems in the Atoyac-Zahuapan basin, in the Lagunera Region, and in areas where major urban and industrial centers discharge their wastes.

The country does not have adequate systems for the treatment of wastewater, and some states totally lack the necessary infrastructure. The volume of wastewater and

the sinking of the ground under Mexico City pose an enormous challenge to sanitary works.

The extent of food contamination is unknown. Secretariat of Health technical standards and health regulations promote food hygiene at all stages, from production, transportation, storage, and distribution to consumption. Many establishments have improved their sanitary conditions; however, total sanitary control and surveillance have been hindered by the Secretariat of Health's limited human and financial resources. Active community participation is required to promote food control systems. Many companies that produce food and nonalcoholic beverages have improved their installations in order to conform to allowable physicochemical and bacteriological levels.

In Mexico City, the extremely high fuel consumption results in permanent air pollution, which is aggravated by the region's orographic characteristics, thermal inversion from November to February, and dust storms from March to June and from August to October. The thermal inversion leads to high levels of pollution in the early hours of the day, and the dust storms stir tons of dust

highly contaminated with pathogenic agents that move from the north to the center and south of the city. The degree of air pollution has created public alarm. The most common pollutants are suspended particulates, sulfur dioxide, hydrocarbons, ozone, acetyl peroxide nitrates and some aldehydes, carbon monoxide, nitrogen dioxide, and lead, all of which are signs of environmental degradation. The measurements taken in recent years illustrate an alarming trend, as ozone has become the most important pollutant in the last three years.

In Mexico City an Air Quality Monitoring Network has been set up in each of the five areas into which the city has been divided. The Secretariat of the Environment and Ecology establishes the allowable values. In late 1988 and early 1989, average air quality was found to be unsatisfactory 44.7% of the time. Based on information from the Network, schools can suspend classes to lessen the need for transportation during the hours of thermal inversion and to enable many children to leave the city. On days when the situation is "very bad," work in highly polluting industries is temporarily halted.

MONTSERAT

GENERAL CONTEXT

Political, Economic, and Social Situation

Montserrat is a British dependency; a Governor appointed by the United Kingdom is the administrative head of government. The territory has its own system of government.

Montserrat's economy has steadily grown since 1983. The gross domestic product (GDP) was \$US2,738 per capita in 1983 and increased to \$US3,550 per capita in 1986. This economic expansion has been fueled by growth in tourism, in financial services (offshore banking), and in construction. Over the past five years, unemployment remained low, varying between 4% and 7%, and inflation fluctuated between 3% and 5.5%. Public service is the major source of employment. Adult literacy is high (96%), and nearly all children aged 5–15 are enrolled in school.

Demographic Characteristics

The total population in 1986 was 11,606. Population growth has been minimal. Because of emigration of the economically active adult population, there is a high dependency ratio—30.4% of the population is under 15 and 12.7% is over 65. Birth and fertility rates have decreased, reaching their lowest values to date in 1987 (15.3 per 1,000 population, and 65 per 1,000 women aged 15–44 years).

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

Health Situation of Specific Population Groups

Child Health

Six stillbirths from 1985 to 1987 represent a rate of 9.8 per 1,000 live births; infant deaths (3, 1, and 5 from

1985 to 1987) represent a rate of 14.8 per 1,000 live births overall—all but one of these deaths were in the neonatal period. The group “conditions originating in the perinatal period” was the principal cause of these deaths. There were no deaths in the 1–4-year-old age group.

Coverage by the maternal and child health services is generally good, and the Expanded Program on Immunization maintains 100% coverage for DPT and polio. Recently, a project on developmental screening was started, and a register of handicapped children has been established.

Health of Adolescents and Adults

The three leading causes of mortality, in descending order of importance, are cerebrovascular accidents, heart disease, and malignant neoplasms. Hypertension also is common, and is a major contributor to heart disease and a frequent cause of hospital admissions and clinic visits. Diabetes, an important cause of morbidity, also ranks among the top ten causes of mortality. There was only one maternal death, which occurred in 1986.

Motor vehicle accidents were one of the leading causes of mortality early in the decade, but since then no significant increases in yearly deaths have been recorded.

Mental health care is provided by the general practitioners and nurses. A psychiatric nurse, responsible for most of the mental health care in the community, coordinates the service with the medical officers. A consultant psychiatrist visits the island from time to time.

The percentage of births from teenage mothers within the total number of births also decreased significantly: it was 28% in 1985 and 20% in 1987. Family planning services have been extended to all 12 government clinics and to the Glendon Hospital. An experimental program for an adolescent health service using government facilities continues in operation.

Health of the Elderly

In 1984, the elderly constituted 12.4% of the population. Hypertension and diabetes are major problems for this group, but data on the health status of the elderly are still very limited.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Montserrat's health care system is modeled after the British system of socialized medicine. Free services are provided from birth to school-leaving age, for pregnant and lactating women, for persons over 60 years of age, and for those who are retired or needy. Persons diagnosed as having hypertension and diabetes receive free medical care, regardless of age or social standing.

The Ministry of Education, Health, and Community Services is charged with providing health services that are accessible, adequate, and affordable to the population, and it provides most of the health care to Montserrat's people. There is a Permanent Secretary for health and community services who is administratively responsible to the Minister. The Permanent Secretary is advised by the Chief Medical Officer, who coordinates the health services. The Ministry's chief executive officer is the Permanent Secretary, and the director of health services/surgeon is the main adviser on professional and technical matters. The following heads of sections report to the director of health services/surgeon: the dental officer, the principal nursing officer, the radiographer, the senior pharmacist, the senior laboratory technician, and the principal environmental health officer.

Functionally, the health services are divided into community services and institutional services. Community services include environmental health, personal health services, maternal and child health, immunization, school health, dental health, mental health, and health education. Institutional services provide inpatient facilities, long-term care (geriatric and psychiatric services), laboratory and x-ray services, and pharmacy. The provision of supplies and equipment, including drugs, is centralized, and distribution to the community and to institutions is based on need.

Although services provided at the community level are free to users, clients pay the hospital for laboratory, x-ray, and patient maintenance services. There is no written health policy, although it is generally agreed that the Government is committed to providing high quality health care with special emphasis on vulnerable groups such as children, pregnant and lactating women, the chronically ill, the mentally ill, and the elderly. A draft national health plan, submitted in 1985 as part of the national development plan, demonstrated the Government's interest in priority areas and groups.

Health care services are based on a three-tier system, which consists of primary, secondary, and tertiary care levels. Primary health care is provided through district health clinics, secondary health care is provided by the only general hospital on the island, and tertiary health care is administered at the geriatric unit. Boundaries be-

tween care levels are not rigidly defined, and the hospital sometimes provides first level care through its casualty department. There are no private hospitals on the island.

The main strategies have been and continue to be an increase in effectiveness by widening the client population, encouraging support of community-based services, upgrading facilities, and ensuring that these have the necessary technical and managerial capabilities. Emphasis is also being placed on improving communication and referrals within and between levels of care, as well as on developing and strengthening the team approach.

There are three main public health areas on the island, each with four district health clinics: the central area has 5,840 inhabitants; the northern area has 3,084 inhabitants; and the eastern area, 2,682. The 12 health clinics are scattered strategically throughout the island so no one has to travel more than two miles to reach a health clinic, thus making the health services physically accessible to the entire population. Each public health area is staffed by one public health nurse/nurse practitioner and four district nurses/nurse practitioners/enrolled nurses.

The Government employs three medical officers and one surgeon; they are also permitted to maintain a private practice. Some specialists visit the island occasionally.

Glendon Hospital, a general hospital in Plymouth, provides secondary care. It has 67 beds (5.7 beds per 1,000 population) and treats medical, surgical, obstetric, and pediatric patients; psychiatric beds are provided on the medical ward. The hospital also has an operating theater and casualty and outpatient departments. The hospital is staffed by a fully trained health service administrator, middle managers, clerical officers, and housekeeping, catering, and general maintenance personnel. If the hospital's facilities are inadequate, patients are referred to larger hospitals in the Caribbean or elsewhere.

There are 35 geriatric beds in the geriatric unit (30.1 beds per 10,000 population). Long-term care is provided there, and among the unit's patients there is a high percentage of persons who have no place to live or no one to live with who can care for them, and some senile patients with organic brain syndrome.

Of the island's total budget for 1983, 13.0% of the recurrent government expenditure and 2.8% of the capital expenditure were budgeted for health. Maintenance of facilities is generally the responsibility of the Ministry of Communication and Works. The amount provided in the health budget specifically for facility maintenance is far below the amount required.

Information on the care provided by the private sector is lacking. In many instances, those who can afford it or who can make private arrangements usually seek specialized care in Barbados, Jamaica, the United States of America, or the United Kingdom. The Government assists or pays the cost for a few needy and deserving cases.

Some progress has been made in strengthening the health information system. All morbidity and mortality statistics are available from the government services; to date, no statistics are submitted by private practitioners. Statistics on health service activities are collected by individual sectors and are not collated or compiled in a centralized location. The format for collection of health statistics needs to be standardized and the system should have adequate resources.

HEALTH AND THE ENVIRONMENT

The territory has a low population density and low intensity patterns of land use, development, and coastal zone activity. Without white sand beaches and with no jet airport, the island suffers minimal environmental effects from tourism at this time.

The greatest solid waste problem is the difficulty in finding a suitable disposal site in the Plymouth suburban area because of social, topographic, and political obstacles. As a result, solid waste has to be transported across the island to the east coast where it is disposed of in sanitary landfill trenches.

Sewage and excreta are disposed of in septic tanks and privies, respectively. Because the land is rocky, subsoil disposal is often problematic. Two new housing developments outside Plymouth propose using package sewage treatment plants.

Aedes aegypti control measures have only been undertaken intermittently, with partial coverage of the island using traditional methods. Of late, greater emphasis has been given to rodent control. The 1988 *Aedes aegypti* household infestation index was 19.5%.

Structural problems are weak institutional capabilities, lack of manpower and other resources, and limited environmental awareness among officials and the public.

NETHERLANDS ANTILLES AND ARUBA

GENERAL CONTEXT

Political, Economic, and Social Situation

The Netherlands Antilles includes the islands of Curaçao, Bonaire (Leeward Islands), Saba, St. Eustatius, and St. Martin (Windward Islands); this island group is considered to be an independent part of the Kingdom of the Netherlands. In January 1986, Aruba separated from the Netherlands Antilles and obtained a "separate status" within the Kingdom of the Netherlands for a period of ten years, thus contributing to a decentralization of governmental prerogatives and the island authorities' responsibilities. St. Martin is divided into a Dutch section and a French section; the latter comes under the Department of Guadeloupe's jurisdiction.

Each island is governed by a Crown-appointed Governor who is the head of the national Government. The Government is also composed of a Council of Ministers and a Parliament. In the Netherlands, a Minister of the Netherlands Antilles and Aruban Affairs, working with a cabinet under his responsibility, oversees the islands' interests.

The economy of the Netherlands Antilles and Aruba is based on oil refineries, tourism, a dike company, fishing, and aviation. During 1982–1985, the economy experienced a deepening recession and higher inflation. The gross national product (GNP) had a negative growth and the effect of the Latin American public debt increased notably. By late 1985, inflation had risen 0.3% in relation to 1984. In 1985, the Netherlands Antilles' GNP came to \$US2.55 billion; 1987 estimates for Aruba put its GNP at \$US515 million. Both figures correspond to approximately \$US10,000 per capita.

According to the 1981 census, the work force represents 68.7% of the total population. For that same year, the percentage of overall unemployment was 6%, but in Curaçao it reached 29%. The educational system in the Netherlands Antilles and Aruba is almost identical to that of the Netherlands; although schooling is not compulsory, illiteracy is almost nonexistent. Of the total popu-

lation, only 5% had less than four years of schooling in 1986. Most residents who pursue advanced studies do so abroad. In 1979 the Netherlands Antilles Upper School became a university.

Demographic Characteristics

In 1987, the population of the Netherlands Antilles was estimated at 192,036; of this number, 153,026 lived in Curaçao, which has a population density of 346 inhabitants per km². The islands of Curaçao and Bonaire have experienced population declines in recent years; however, in St. Martin, St. Eustatius, and Saba the population has grown. Bonaire has the lowest population density (27 inhabitants per km²) and St. Martin, the highest (627 inhabitants per km²). A distinction between urban and rural areas is impractical, given the islands' small size and urban characteristics. The 1987 population of Aruba was estimated at 59,881. The population declined from 1984 to 1987, but grew again in 1988, reaching 60,757 inhabitants and resulting in a population density of 315 inhabitants per km².

According to the 1981 census, 28.9% of the Netherlands Antilles population (including Aruba) was under 15 years of age, 64.4% was in the 15- to 64-year-old age group, and 6.7% was 65 years or over.

The population of the Netherlands Antilles and Aruba is ethnically mixed. Although there are no known figures on internal migration, emigration from Aruba took place from 1985 to 1987 following the closing of the Lake Refinery. The rates by year were -3.6%, -1.7%, and 0.7%, respectively. By 1988, the population again increased, with an estimated growth rate of 1.5%.

Birth and fertility rates are low. In 1985 the birth rate in the Netherlands Antilles and Aruba was 17.5 per 1,000 population, and the fertility rate was 73.5 per 1,000 women 15 to 44 years old. In Aruba, the 1985 birth rate was 16.4 per 1,000 population. In the Netherlands Antilles, the birth rate in 1987 was 19.5 per 1,000 population. In 1985, life expectancy in the Netherlands Antilles and Aruba was 71.1 years for men and 75.8 years for women.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

Mortality registration has improved in recent years. In the Public Health Department death certificates are received from all the islands except Aruba. In 1985, the overall death rate was 5.3 per 1,000 population for all the islands, except for the Windward Islands, where the rate was only 3.5 per 1,000 population. In 1987, the overall death rate in the Netherlands Antilles remained practically the same, 5.4 per 1,000.

In Aruba, overall mortality in 1988 was 5.5 per 1,000 population. That same year, the leading causes of death in Aruba were cardiovascular diseases (40.5%), neoplasms (23.6%), accidents (9.1%), and endocrine and metabolic diseases (8.7%) (Table 1).

In 1985, the principal causes of death in the Netherlands Antilles (excluding Aruba) were cardiovascular diseases (32.9%), neoplasms (23.4%), certain diseases originating in the perinatal period (7.3%), and accidents (4.9%) (see Table 1).

Health Situation of Specific Population Groups

Child Health

In 1985, the infant mortality rate was 18.4 per 1,000 live births. There were 80 deaths of children under 1 year old: 4 were attributed to ill-defined causes; of the remaining 76, 44 (58%) were due to diseases originating in the perinatal period, 12 (16%) to congenital anomalies, and 8 (11%) to accidents. In 1988, the infant mortality rate in Aruba was 11.8 per 1,000 live births, and in the Netherlands Antilles, 12 per 1,000.

In Aruba, mortality in children 0 to 14 years old accounted for only 3.6% of all deaths in 1988.

Health of Adolescents, Adults, and the Elderly

In 1987, cardiovascular diseases accounted for 32.9% of all deaths and ranked as the leading cause of overall mortality; in 1988, the figure for Aruba was 40.5%. Within this category, cerebrovascular accidents accounted for 32.7% of deaths (26.4% in Aruba), and ischemic heart disease, 30.4% in Aruba. The age group 60 years old and older was most affected by ischemic heart disease. Of cerebrovascular accidents, 66% occurred in persons older than 70 years.

In 1987, deaths from neoplasms accounted for 23.4%

of total deaths from all causes in the Netherlands Antilles, with a rate of 107.3 deaths per 100,000 population; in Aruba the figure was 23.6 per 100,000 in 1988. In Aruba, the most frequent cancer site was the digestive system (43.8%), followed by the genitourinary organs (17.8%). In males, the most frequent sites continue to be the trachea, the bronchia, and the lung, and in females, the cervix and the respiratory tract. The private sector and the Government have cooperation programs for attending to patients with malignant neoplasms.

Accidents are the third leading cause of mortality in Aruba (9.1%) and the fourth in the Netherlands Antilles (4.9%); most occur in the adult population (more than 90%). In Aruba a high proportion of deaths is due to motor vehicle traffic accidents (53.6% of the total).

Joint working groups have been established within governmental agencies to study the problems of the disabled and the elderly and to recommend solutions. The private sector operates institutes for several types of disabilities.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

The Governments of the Netherlands Antilles and Aruba pursue a policy of extending health services to the entire population; preventive programs hope to achieve 100% coverage. There is legislation that guarantees health care for the entire population, including the possibility of obtaining specialized treatment abroad. Within the policy of decentralization that is being implemented, efforts are under way to achieve close cooperation and coordination between governmental and private institutions.

At the central level the only data available are on mortality (for most of the islands, except Aruba) and registers of health professionals. There also is some incomplete information on physical resources, morbidity, and health services delivery, much of which is gathered only sporadically. Studies have been initiated to determine the current status of the information system and to identify critical areas and the most important problems.

Installed Capacity

In the Netherlands Antilles and Aruba there are 35 health establishments with a total of 2,698 beds (1987), 50% of which are in general hospitals (Table 2). Ac-

| Cause of death | Netherlands Antilles (1987) | | Aruba (1988) | |
|--|-----------------------------|----------------|--------------|----------------|
| | No. | % ^a | No. | % ^a |
| All causes | 1,075 | 100.0 | 337 | 100.0 |
| Signs, symptoms, and ill-defined conditions | 66 | 6.1 | 28 | 8.3 |
| All deaths from defined causes | 1,009 | 100.0 | 309 | 100.0 |
| Cardiovascular diseases | 330 | 32.9 | 125 | 40.5 |
| Neoplasms | 236 | 23.4 | 73 | 23.6 |
| Accidents | 49 | 4.9 | 28 | 9.1 |
| Conditions originating in the perinatal period | 74 | 7.3 | 6 | 1.9 |
| Endocrine and metabolic diseases | — | — | 27 | 8.7 |

^aThe percentage per cause is based on total deaths from defined causes.

Sources: Department of Public Health, Netherlands Antilles, 1985, and Statistical Yearbook, Central Statistics Office, Aruba, 1989.

According to the estimated population for that year, the average ratio of population per bed is 90 persons per bed (11.1 beds per 1,000 inhabitants) in the Netherlands Antilles, 76 persons per bed (13.2 beds per 1,000 population) in Bonaire, and 83 persons per bed (12 beds per 1,000 population) in Curaçao. Of the total, 33 facilities are located in the Netherlands Antilles, with 2,130 beds (47% in general hospitals), and 2 are in Aruba, with 568 beds (51% in general hospitals). All hospitals are private, except the Psychiatric Hospital of Curaçao, which belongs to the Federal Government; the system's organization guarantees good health care coverage for the entire population.

There are three outpatient health care services in Curaçao, Aruba, and St. Martin that offer primary care. In addition, there are five occupational medical care services (four in Curaçao and one in Aruba). In Aruba a single national health insurance system is being organized that will begin operations in 1990.

Financing of the Health Services

In the Netherlands Antilles the health system is financed by the Federal Government, social security, the island governments, the private sector, and private in-

| Hospital location | Total beds | General hospital | Nursing home | Others |
|----------------------|------------|------------------|--------------|------------------|
| Curaçao | 1,839 | 839 | 399 | 601 ^a |
| Bonaire | 138 | 69 | 69 | — |
| St. Martin | 98 | 56 | 42 | — |
| St. Eustatius | 20 | 20 | — | — |
| Saba | 35 | 15 | 20 | — |
| Netherlands Antilles | 2,130 | 999 | 530 | 601 |
| Aruba | 568 | 292 | 236 | 40 ^b |

^aIncludes 130 beds in the Pediatric Hospital, 21 in the Maternity Hospital, and 450 in the Psychiatric Hospital.

^bFrom the General Psychiatric Hospital.

insurance companies. The Federal Government covers expenditures for medical and health care services of government employees, their family members, retirees, and those who work part time for the Government. Social security covers the medical expenditures of those who work in private industry and commerce. Private companies cover their employees' costs. The private insurance companies have bilateral agreements for serving persons affiliated with these insurance institutions. The local governments finance the island health services; they provide free medical care to the general population.

Total health sector expenditures came to \$US104.7 million in 1982 and \$US119.4 million in 1985. Per capita health expenditure is \$US781.

Human Resources

In 1987, the Netherlands Antilles had 295 practicing physicians, 38.7% of whom were general practitioners; Curaçao alone had 207 physicians and Aruba had 63. Some work full time, part time, or by contract for the Government. In 1987 the Netherlands Antilles had 272 registered nurses (1.2 nurses per physician) and 862 nursing auxiliaries and aides. The corresponding figures for Aruba were 191 nurses (3.0 nurses per physician) and 222 nursing auxiliaries and aides.

Medical students complete their final years of training in the existing hospitals in Curaçao (and partly in Aruba). A university in the Netherlands grants the diploma, which is recognized in the Netherlands and in the other countries of the European Economic Community. Partial training for some specialties can be done in Curaçao.

Curaçao has a school for training nurses. In 1983, the school graduated 67 nurses (with four years of training), 33 practical nurses (with two years of training), 8 district

nurses (with degrees in home care; after two years of service, a registered nurse may specialize in this field), and 10 community nurses. Aruba has a course to train registered nurses (requiring three and one-half years of training); in 1983 the program graduated 31 nurses.

HEALTH AND THE ENVIRONMENT

The coverage of drinking water supply services has remained adequate in both the Netherlands Antilles and Aruba. Aruba, Bonaire, Curaçao, and St. Martin have closed circuit drinking water systems, each of which uses a plant for distilling sea water; in Saba and St. Eustatius rainwater is used. In Aruba, 98.7% of the dwellings were connected to the drinking water supply system as of 1987, and 96.6% had an adequate system for excreta disposal.

The Netherlands Antilles has adequate coverage for disposing of solid waste, which is deposited in sanitary landfills. Sometimes the Government uses the services of private trucks to cope with existing needs. In some instances, waste has been dumped into the ocean, but this problem is currently being resolved. However, there is still pollution from disposable bottles, tin cans, etc., especially in Aruba and Curaçao; the island governments and some private groups are presently attempting to take adequate environmental sanitation measures to eliminate this problem as well.

Within the Island Public Health Service, Curaçao and Aruba have a department for inspection and control of food sanitation; food merchants must comply with legal requirements.

The main source of environmental pollution is the oil refinery in Curaçao. Air pollution levels in urban areas are high, and land and maritime pollution from oil products is lower.

NICARAGUA

GENERAL CONTEXT

Political, Economic, and Social Situation

On analyzing the country's situation from 1985 to 1988, it is important to consider that since 1979 the country has experienced a process of transformation that has included the establishment of a mixed economy, participatory democracy with political pluralism, and an international policy of nonalignment. The period after 1979 also coincided with a new international economic crisis that affected the country's development, given the extent of the national economy's interdependence on the international market. Furthermore, the armed conflict led to a major recession whose effects were manifested in 1985–1988.

After the 1984 elections, and as a consequence of its results, the Nicaraguan revolution entered a stage of institutionalization that was undertaken within a complex situation due to the war and the economic crisis. In 1985, the drafting of the new Constitution began, an effort in which the entire society participated.

At the international level, the Government encouraged a bilateral dialogue with the United States of America in order to achieve peace, while simultaneously pursuing international support in the search for ways to reach the country's pacification and ensure a way out of the regional crisis. The Government also formulated initiatives to promote understanding among the Presidents of the Central American region within a democratic framework.

The Constitution was approved in late 1986 and went into effect in early 1987. It defines responsibilities for each branch of government and reaffirms the intent of the revolution regarding political pluralism, a mixed economy, self-determination, national sovereignty, a policy of nonalignment, and participatory democracy. At the same time, it precisely delineates the civil, political, and social rights of citizens, thus establishing a new concept of citizenship in the country. The Constitution stresses the comprehensive concept of health and its intimate connection with other social rights.

Another noteworthy aspect was the process of regionalization begun in 1982 and further developed in 1985–1989. Initially, this process aimed at strengthening the State's effectiveness as a function of a close contact with

local experiences. Currently, regionalization supports economic planning, especially in terms of the integration of productive processes in specific areas. Thus, regionalization in this period has been strengthened through the population's dynamic participation, which has even facilitated the decentralization efforts that intensified beginning with the 1987 economic plan.

In late 1984, recession was clearly felt, with a negative growth in the gross domestic product (GDP) of –1.6% and an average inflation rate of 35.4%; the latter rate is considered to be lower than it would have been without the Government's economic policy. Furthermore, overall production, which began to recover in 1980–1981, stagnated, mainly due to the agricultural and livestock sector; this affected both domestic consumption of basic goods and the capacity to export traditional products, further restricting the import capability and deepening the negative balance of trade (which dropped from –\$US375.6 million in 1984, to –\$US441.8 million in 1985, and to –\$US525.0 million in 1987). To address this situation, the National Planning Council and its technical body, the Secretariat of Planning and Budget, were established. The latter designed an economic policy that included concessions to the law of value and supported the population's initiatives for coping with the crisis. This policy aimed at stabilizing the macroeconomic situation, rationalizing social expenditures, and boosting national production by regaining control of the financial situation. However, three months after the stabilization measures were initiated, the U.S. Government decreed a trade embargo and exerted political pressures to curtail the country's access to external financing from the main international lending agencies. These measures seriously affected the marketing of Nicaraguan products abroad and, given the country's technological dependency, efforts to support the productive process (mainly in industry).

In 1987, the GDP declined 2.2% in relation to 1985, and inflation reached 1,700% that year. In early 1988, the Government launched a monetary reform coupled with several economic measures (controlling public spending, taxing the productive sector, and other measures). Despite these measures, inflation once again escalated in February 1988.

Foreign trade was considerably reduced and was subsidized by external indebtedness, which in 1986 reached \$US6.12 billion, equivalent to 264.5% of the GDP. Of

this balance, \$US1.61 billion was taken on in 1985 and 1986.

Although public spending as a percentage of the GDP diminished (55.6% of GDP in 1985, 46.0% in 1986, 37.7% in 1987, and 43.9% in 1988), defense spending increased from 34.5% to 45% of the national budget from 1985 to 1987. Annual inflation was 278% in 1985, 778% in 1986, and 5,000% in 1988. Real per capita consumption fell 35% in 1988; this decline had the greatest impact on the most underprivileged social groups.

During 1985–1988, the primary and tertiary sectors absorbed the greatest volume of the work force. The latter sector experienced the most growth, and the State became this sector's main employer. The rate of underutilization of the work force increased from 20.9% in 1985 to 26% in 1988, without including those persons who work in defense tasks, or the growth of the informal sector and the reduction of installed capacity in industry and agriculture.

A new surge of activity in the country's life began in 1988, due to the economic policy adjustments and the progress in the dialogue with the resistance that led to the first temporary cessation of hostilities. At the same time, advances in the national dialogue and the easing of some restrictions imposed under the state of emergency favored the implementation of economic measures.

Illiteracy increased from 12.8% in 1980 to 26% by late 1987. In this same period, the education budget fell from 14.5% of the national budget to 8.9%, and from 4.6% of the GDP to 3.6%.

In order to cope with the housing shortage, which is estimated at nearly 250,000 dwellings, a program was undertaken to resettle persons displaced by the war in safe areas. Volunteer brigades built houses, and the housing project was supported by the community's organization and received material support from the regional governments.

Currently, social security carries out relief and social welfare programs directed both at the wage-earning population and their dependents and to those population groups which, for different social reasons, require special attention. Table 1 compares the scope of social security coverage in 1985 and 1987 with that of 1980.

In order to effectively provide relief and social welfare, the Government required new internal and external sources of financing. Although by 1987 the volume of contributors had grown 118% as compared to 1980, the number of pension beneficiaries also increased, from 16,000 to 60,500.

Matters pertaining to medical care were transferred to the Ministry of Health; however, given conditions and needs created by the war, social security has once again assumed some medical care functions, particularly those that concern the care of persons wounded or disabled in the war. The National Social Security and Welfare In-

| Coverage | 1980 | 1985 | 1987 |
|---|-------|---------|---------|
| Insured contributors (thousands) | 146.4 | 289.8 | 319.2 |
| Protected population (thousands) | 20.5 | 1,030.3 | 1,232.5 |
| Beneficiaries/employed population (%) | 16.8 | 27.7 | 28.3 |
| Population protected/total population (%) | 19.0 | 31.5 | 35.2 |
| Current pensions (thousands) | 16.0 | 49.4 | 60.5 |

Source: National Social Security and Welfare Institute.

stitute plays a major role in caring for this population group, including financial assistance for required care abroad and of support for completing rehabilitation in the country.

Although in 1985 and 1986 some foodstuffs were scarce (beans, corn, milk, meat, eggs, fats, and bananas), the national supply of rice and sugar was sufficient. From 1985 to 1986, per capita consumption was reduced in terms of the recommended minimum levels of consumption, especially for milk, meats, and eggs; for other products, the drop in consumption was even greater. During that period, production and distribution subsidies for many goods were gradually reduced without a proportional increase in wages, and the population was forced to establish priorities for consumption of certain products. The basic food basket, which represented 45.2% of the individual wage in 1981, reached 169.9% in 1986. The cost of this basic food basket was 62.5% of the family wage in 1985 and 101.9% in 1986.

As a result of the adopted economic measures, by early 1988 the cost of the basic food basket was equivalent to 76.5% of the average individual wage, but by June of that year, it had climbed to 406.5%; by November, after wage adjustments, it fell to 375.4%.

Demographic Characteristics

In 1988, the population of Nicaragua was estimated at 3,621,600, with a rate of increase of 3.3% in the period and an overall fertility rate of 5.5 children per woman. In 1988, according to estimates of the National Institute of Statistics and Census (INEC) and the Latin American Center of Demography (CELADE), 3.9% of the population was under 1 year old; 14.3% was 1 to 4 years old; 28.2%, 5 to 14 years old; 51.1%, 15 to 64 years old; and 2.7%, 65 years and over.

Population density increased from 27 inhabitants per km² in 1985 to 30 in 1988. The population's geographic distribution is uneven: the Pacific area, which covers 15.2% of the territory, has 62.5% of the total population, and the Atlantic area, which corresponds to 39.5% of the territory, has 5.3% of the population. Internal migration patterns influence this situation, making region III the fastest-growing region in terms of population (4.3%); the capital, Managua, is located in that region.

According to INEC and CELADE estimates, 57.2% of the population was urban in 1985; it is estimated that this figure will reach 60.4% by the end of the five-year period. There are more women in the urban areas (51.6%), while in the rural areas men predominate (52.1%).

As a consequence of the war, more women are being incorporated into the productive work force (even in rural areas), and this is expected to have some effect on traditional customs.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

It is estimated that the available information for the period from the National System of Vital Statistics (SI-NEVI) had a coverage of 47%. INEC and CELADE estimate a crude death rate of 9.7 per 1,000 population for 1980–1985 and of 8.0 per 1,000 for 1985–1990. Available data yield death rates of 4.5 per 1,000 inhabitants in 1985, 4.2 per 1,000 in 1986, and 4.0 per 1,000 in 1987.

In 1987, 13,985 deaths were registered, 27.6% of which were children under 1 year old; 5.0%, children 1 to 4 years old; 3.2%, children 5 to 14 years old; 29.5%, persons 15 to 49 years old; and 34.6%, persons 50 years and older. Deaths in males increased from 59.6% of the total in 1985 to 61.8% in 1987. Among registered deaths, most were in urban areas (73.2% in 1987). The hospital death rate for all age groups declined from 28.7 per 1,000 discharges in 1985 to 25.7 per 1,000 in 1987.

The leading causes of mortality recorded in 1987 were acute diarrheal diseases and other intestinal infectious diseases, injuries resulting from operations of war, and cerebrovascular diseases (Table 2).

The analysis of the structure and composition of morbidity is done primarily through the ongoing registration of consultation sheets, of forms for diseases that require notification, hospital admissions and discharges, and some operational studies for groups and specific causes. Table 3 shows the leading causes of hospital discharges.

In 1987, intestinal infections were the leading cause of hospital morbidity (and mortality). That same year, there were 6,459,600 consultations: 9.9% in children under 1 year old, 14.6% in children 1 to 4 years old, 13.8% in the age group 5 to 14 years old, and 61.7% in persons 15 years old and older.

According to INEC and CELADE, infant mortality was estimated at 76.4 per 1,000 live births in 1980–1985 and at 61.7 per 1,000 for 1985–1990, which shows that infant mortality remains high. The recorded data place infant mortality at 28.6 per 1,000 live births in 1985, 29.9 per 1,000 in 1986, and 28.0 in 1987. Mortality in this age group accounted for 25.7% of the deaths registered in 1985 and 27.6% in 1987.

According to INEC and CELADE estimates, life expectancy at birth rose from 59.8 years in 1980–1985 to 63.3 in 1985–1990.

Health Situation of Specific Population Groups

Child Health

The leading causes of mortality recorded in children under 1 year old in 1987 were acute diarrheal diseases and other intestinal infectious diseases; hypoxia, birth asphyxia, and other respiratory conditions of newborns; and pneumonia (Table 4). Acute diarrheal diseases caused 27.6% of infant deaths registered in 1985, and 32.0% in 1987.

The leading causes of hospital discharges in this age group in 1987 were ill-defined intestinal infections (13,895 discharges); pneumonia (6,644); other causes of perinatal morbidity (4,236); and hypoxia, birth asphyxia, and other respiratory conditions of the fetus and newborn (2,377). Ill-defined intestinal infections were also the leading cause of hospital mortality in that age group in 1987 (549 deaths). The importance of this category as a cause of morbidity and hospital mortality is tied to the weight of diarrheal diseases as a reason for consultation during the period, and it reflects the population's deteriorating health conditions.

In 1988, vaccination coverage in children under 1 year old was estimated at 83% with polio vaccine, 55% with measles vaccine, 51% with DPT vaccine, and 89% with BCG.

In children 1 to 4 years old, registered deaths increased from 675 in 1985 to 704 in 1987. These deaths accounted for 4.6% of total deaths registered in 1985 and 5.0% in 1986 and 1987. The leading cause of mortality from 1985 to 1987 was the cause group acute diarrheal diseases and other intestinal infectious diseases; pneumonia was the second leading cause in those three years.

| Cause groups | 1985 | 1986 | 1987 |
|---|-------|-------|-------|
| Acute diarrheal diseases and other intestinal infectious diseases | 1,389 | 1,680 | 1,741 |
| Diseases of pulmonary circulation and other diseases of the heart | 1,016 | 867 | 792 |
| Cerebrovascular disease | 832 | 854 | 848 |
| Pneumonia | 713 | 761 | 824 |
| Slow fetal growth, malnutrition, and fetal immaturity | 696 | 709 | 162 |
| Injuries resulting from operations of war | 649 | 626 | 1,061 |
| Acute myocardial infarction | 502 | 606 | 674 |
| Injuries undetermined whether accidentally or purposely inflicted | 546 | 424 | 543 |
| Nephritis, nephrotic syndrome, and nephrosis | 404 | 394 | 345 |
| Motor vehicle traffic accidents | 341 | 457 | 494 |
| Homicide and purposely inflicted injuries | 328 | 159 | 182 |
| Cirrhosis and other chronic diseases of the liver | 294 | 271 | 273 |
| Hypoxia, asphyxia, and other respiratory conditions in newborns | 293 | 303 | 697 |
| Mental disorders | 237 | 152 | 177 |
| Pulmonary tuberculosis | 226 | 247 | 218 |
| Bronchitis, emphysema, and asthma | 210 | 181 | 183 |
| Diabetes mellitus | 210 | 181 | 183 |
| Congenital anomalies | 204 | 202 | 215 |
| Septicemia | 188 | 147 | 80 |
| Other protein-calorie malnutrition | 159 | 147 | 132 |
| Hypertensive disease | 155 | 149 | 129 |
| Accidental drowning and submersion | 155 | 237 | 184 |
| Sepsis of newborns | 136 | 137 | 235 |
| Malignant neoplasm of stomach | 129 | 128 | 135 |
| Other accidents | 514 | 454 | 489 |
| Other malignant neoplasms | 407 | 389 | 372 |
| Other diseases of the digestive system | 368 | 338 | 310 |

Source: National Division of Statistics and Information Science (DINEI) and National System of Vital Statistics (SINEVI).

Pneumonia, ill-defined intestinal infections, and the cause group chronic bronchitis, emphysema, and asthma remained the three leading causes of hospital discharges.

In 1987, malnutrition was the direct cause of 2% of all deaths registered in children under 5 years old (and 1% of the deaths in the overall population). According to the National Census of Height, conducted among first-grade schoolchildren in 1987, the prevalence of malnutrition was 22%.

In June 1988, a National Plan was drawn up to address the problem of infant mortality and mortality in children

1 to 4 years old through the National Campaign in Defense of Children's Lives. This campaign involves several coordinated and coherent activities designed to continuously reduce mortality in those age groups.

Although the population 5 to 14 years old represents 28.2% of the total population, its mortality accounts for only 3.2% of all registered deaths. In this group, mortality is linked to the structure of causes, since in addition to the persistence of certain communicable diseases, other causes such as violent acts, accidents, and degenerative diseases have been on the rise. In 1987, the leading causes

TABLE 3**Leading causes of hospital discharges, Nicaragua, 1987.**

| Diagnosis | 1987 |
|---|---------|
| Normal delivery | 42,681 |
| Ill-defined intestinal infection | 18,711 |
| Other direct obstetrical causes | 12,822 |
| Pneumonia | 11,559 |
| Unspecified abortion | 9,053 |
| Chronic bronchitis, emphysema, and asthma | 6,226 |
| Hernia of the abdominal cavity | 4,919 |
| Other causes of perinatal morbidity | 4,236 |
| Hemorrhage of pregnancy and childbirth | 1,928 |
| Infections of the skin and the subcutaneous cellular tissue | 3,231 |
| Other diseases of the digestive system | 2,779 |
| Other disorders of the female genitourinary tract | 2,655 |
| Premature delivery or threatened abortion | 2,770 |
| Other diseases of the urinary tract | 2,730 |
| Hypoxia and asphyxia | 2,394 |
| Fractures of the humerus, ulna, and radius | 1,875 |
| Toxemia of pregnancy | 1,685 |
| Appendicitis | 1,913 |
| Pulmonary tuberculosis | 1,947 |
| Slow fetal growth | 1,821 |
| Cardiac insufficiency | 1,351 |
| Total | 222,444 |

Source: DINEI-Ministry of Health.

of registered mortality were motor vehicle traffic accidents (53 deaths), other accidents (51), injuries undetermined whether accidentally or purposely inflicted (34), and pneumonia (29). That same year, the leading causes of hospital discharges were appendicitis (609 discharges), pneumonia (527), and malaria (405).

Health of Adolescents and Adults

The leading causes of mortality registered in the age group 15 to 49 years old are causes associated with the war, chronic and degenerative diseases, and, to a lesser extent, causes that derive from sanitary conditions (Table 5). In 1987, the six leading causes were external causes: injuries resulting from operations of war were the leading cause of death, and their weight in this age group jumped from 15.7% of the total in 1985 to 24.7% in 1987.

An evaluation conducted by a United Nations Population Fund mission estimated maternal mortality at ap-

proximately 8 per 10,000 registered live births. It is estimated that only 5% of women of childbearing age and in consensual union use contraceptives.

Normal delivery was the leading cause of hospital discharges during the period, although the number of discharges from this cause declined from 44,964 in 1985 to 42,681 in 1987. Discharges due to obstetrical problems increased, except for hemorrhage of pregnancy and childbirth. Premature delivery and threatened abortion increased from 2,477 in 1985 to 2,770 in 1987. Toxemia of pregnancy increased (from 1,639 to 1,685), as did abortions (from 8,209 in 1985 to 9,053 in 1987). In 1985 and 1987, abortions accounted for 4.1% of all hospital discharges.

The various factors that contributed to the problem of maternal and neonatal mortality were identified, and a sex education program was organized. In addition, programs for perinatal control and for attending to low- and medium-risk deliveries were redirected to the primary level.

Mortality registered in the age group 50 years old and older has shown a downward trend, both in absolute numbers and in the percentage of total registered deaths. Mortality in this group accounted for 40.2% of the total in 1985, 39.6% in 1986, and 34.6% in 1987. In 1987, the leading causes of mortality in this age group were cerebrovascular disease, acute myocardial infarction, and the cause group diseases of pulmonary circulation and other diseases of the heart (Table 6). In 1987, hospital discharges in this age group were mostly due to cardiac insufficiency (1,060 discharges), other diseases of the digestive system (738), and diabetes mellitus (703).

Problems Affecting the General Population

The health sector reflected the deepening of the armed conflict and of the economic crisis in terms of the increase of morbidity and mortality from certain diseases in both the civilian population and those involved in defense. This, in turn, generated more demand for services at the primary and hospital levels, while available resources remained insufficient in both quantity and quality. Moreover, certain health programs had little access to important geographical areas and population groups, human resources and equipment were lost, and some health units were closed due to their partial or total destruction. Furthermore, as the country's import capability was curtailed, the supply of drugs, materials requiring periodic replacement, reagents, insecticides, equipment, and parts was limited. From 1980 to August 1988, direct victims of the war came to 56,718 dead, wounded, and kidnapped; of these, 42,328 (75%) were in the 1985-1988 period.

Hurricane Joan affected general conditions in the coun-

| Group of causes | 1985 | 1986 | 1987 |
|---|-------|-------|-------|
| All causes | 3,750 | 4,025 | 3,862 |
| Acute diarrheal diseases and other infectious intestinal diseases | 1,035 | 1,303 | 1,285 |
| Slow fetal growth, malnutrition, and fetal immaturity | 693 | 708 | 161 |
| Pneumonia | 329 | 378 | 408 |
| Hypoxia, asphyxia, and other respiratory conditions in newborns | 238 | 302 | 695 |
| Congenital anomalies | 176 | 177 | 187 |
| Sepsis of newborns | 136 | 137 | 235 |
| Other causes of mortality in newborns | 121 | 123 | 180 |
| Septicemia | 105 | 87 | 38 |
| Other protein-calorie malnutrition | 101 | 66 | 60 |
| Meningitis | 67 | 70 | 46 |
| Other diseases of the respiratory tract | 41 | 59 | 70 |

Source: DINEI-SINEVI.

| Group of causes | 1985 | 1986 | 1987 |
|---|-------|-------|-------|
| All causes | 3,845 | 3,438 | 4,132 |
| Injuries resulting from operations of war | 505 | 560 | 1,022 |
| Injuries undetermined whether accidentally or purposely inflicted | 451 | 343 | 437 |
| Homicides and purposely inflicted injuries | 265 | 135 | 163 |
| Motor vehicle traffic accidents | 216 | 289 | 325 |
| Diseases of pulmonary circulation and other diseases of the heart | 156 | 116 | 114 |
| Cirrhosis and other chronic diseases of the liver | 118 | 100 | 121 |
| Accidental drowning and submersion | 115 | 164 | 139 |
| Pulmonary tuberculosis | 94 | 95 | 120 |
| Other accidents | 253 | 212 | 270 |
| Other malignant neoplasms | 114 | 101 | 104 |

Source: DINEI-SINEVI.

try; damages to dwellings and basic services (water, power, health services, and others) and the displacement or isolation of major population groups, further deteriorated the already precarious living conditions in the affected areas. This situation increased the risk of epidemics, particularly in the regions where water supply and services for excreta and waste disposal were deficient. The de-

struction of the infrastructure and the loss of equipment and medical and nonmedical inputs worsened the already limited capability to assist the population.

The basic factors that determined the persistence of malaria and its epidemic risk were the difficulty of providing coverage in the war zones, increases in the population's internal migration without epidemiological con-

| Group of causes | 1985 | 1986 | 1987 |
|---|-------|-------|-------|
| All causes | 5,867 | 5,627 | 4,834 |
| Diseases of pulmonary circulation and other diseases of the heart | 778 | 696 | 517 |
| Cerebrovascular disease | 721 | 764 | 683 |
| Acute myocardial infarction | 506 | 521 | 528 |
| Nephritis, nephrotic syndrome, and nephrosis | 237 | 229 | 213 |
| Pneumonia | 228 | 201 | 197 |
| Diabetes mellitus | 174 | 162 | 146 |
| Cirrhosis and other chronic diseases of the liver | 173 | 165 | 150 |
| Acute diarrheal diseases and other intestinal infectious diseases | 122 | 136 | 138 |
| Other malignant neoplasms | 275 | 270 | 241 |
| Other diseases of the digestive system | 205 | 212 | 164 |

Source: DINE-SINEVI.

trols, the high levels of infestation and exposed population, and the uneven availability of inputs and transportation.

Despite the stratification strategy that was designed for optimizing the scanty available resources, the number of malaria cases increased from 15,130 in 1985 to 32,677 in 1988, with a parasitic infection index of 4.6 in 1985 and 9.0 in 1988. Malaria cases caused by *Plasmodium vivax* increased, as did those caused by *P. falciparum*.

Among other diseases requiring notification, the incidence of pulmonary tuberculosis increased from 4.5 per 10,000 population in 1985 to 6.5 in 1988. Viral hepatitis and typhoid fever were characterized by their endemic behavior; there was an epidemic outbreak of typhoid fever in 1987, when 961 cases were reported (for a rate of 2.7 per 1,000 population).

The persistence of the *Aedes aegypti* vector, which in 1984 had infestation rates of 0.62% at the national level and of 2.3% in Managua; the deterioration of sanitary conditions; the lack of inputs; and the existence of cases in neighboring countries brought on a dengue epidemic in 1985. It mostly affected the area along the Pacific Ocean. There were 11,488 cases reported and serotypes I and II were isolated.

Mortality from human rabies increased, mostly due to an increase in animal rabies, but also due to inadequate vaccination coverage and control of dogs, insufficient surveillance of the virus' circulation in animals, and deficient coverage in the rural areas (where the registered cases originate).

Gonorrhea, the sexually transmitted disease with the

highest incidence, increased from 2,267 cases in 1985 to 3,210 in 1988. The reported cases of acquired syphilis declined from 1,773 in 1985 to 458 in 1988.

In 1986, the national AIDS program was organized. From August 1987 to May 1988, 21 seropositives were detected, all foreigners. From May to December 1988, 4,271 samples were analyzed in order to detect HIV antibodies; seven of these were seropositives; two deaths from AIDS were reported.

In 1986 there were outbreaks of measles (2,550 reported cases) and rubella (2,528 cases). In 1988, there were 6,026 cases of chickenpox and 3,297 cases of amebiasis. In 1988, the incidence of epidemic mumps doubled in comparison to the previous year (3,414 cases, as compared to 1,649 in 1987).

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

With the triumph of the Nicaraguan revolution, the Unified National Health System (SNUS) was established, and the Ministry of Health, its directing agency, was restructured. The development of SNUS began with the coordination and reorganization of the public institutions and services; all public services (including the medical services of the social security) were placed under the re-

sponsibility of the Ministry of Health. Health services were regionalized and organized into three political and administrative levels, according to the Ministry of Health's structure (central, regional, and local). At the local level two administrative areas were defined: the health area and the hospital.

New programs were designed to provide comprehensive care through the services' operational levels and with community participation. The health areas were set according to geographic and demographic criteria, and hospital services were redirected to ensure equitable access for the population.

At the health area level, a model with the health center as its core was planned as a way to coordinate other outpatient care services. A wide-ranging program for extending the services infrastructure through national budget funds, foreign loans, or foreign donations also was implemented. The community facilitated this process through its organized and ongoing participation in the design and formulation of health policy and in its implementation.

This process remained incomplete due to resource limitations and to organizational and political and administrative deficiencies, and in 1984 the situation worsened because of the economic crisis and the war.

In 1985 and 1986, the health policy was directed at stemming deterioration brought on by the war and the crisis, by defining combatants, workers, and children as priority groups. Programs were undertaken to care for the disabled, persons displaced by the war, and combatants and to prevent certain occupational risks. In late 1987, progress had been made in formulating a three-year plan that focuses on the problems of infant mortality and on morbidity and mortality from violent acts.

In the area of health legislation, the main effort involved the drafting of the General Health Law, which includes the substantive aspects that will govern the Unified National Health System of the Ministry of Health, intersectoral relations, the organization and operation of the services, medical care, professional practice, and the duties and rights of the population regarding health. It included the drafting of the sanitary code, which more precisely determines the areas of responsibility of public and private institutions, as well as the population's rights and responsibilities.

Production of Services

In 1987 there were 1.8 medical consultations per inhabitant, as compared with 1.9 in 1984, 1.7 in 1985, and 1.8 in 1986. There were 0.14 dental consultations per inhabitant in 1984 and 1985, 0.17 in 1986, and 0.16 in 1987. Care for women increased, including prenatal and fertility monitoring. The country has yet to define a

policy for controlling the birth rate; health services related to childbearing have been provided in response to spontaneous demand or by medical prescription.

Hospital discharges increased from 187,540 in 1981 to 222,444 in 1987; provisional figures indicate that they rose to 228,480 in 1988. Table 7 shows the percentage of bed occupancy, average length of stay, and bed turnover in hospital establishments for 1981 and 1985–1988.

The number of surgical interventions increased as demand was increased due to the war and as surgical brigades were developed. Hospital care for deliveries showed an upward trend, while coverage of deliveries by the health services dropped from 42.8% in 1981 to 37.3% in 1987.

Installed Capacity

As a result of the counterrevolutionary activity, more than 50 units for outpatient care and one hospital shut down in 1985. However, in response to the displaced population groups, the Government opened new units as a part of its comprehensive care. These new units do not necessarily have the ideal conditions for providing services. Thus the number of these units in operation fluctuated from 518 units in 1984 to 502 in 1985 and 619 in 1987. Of these, 30 were hospitals (26 for acute patients and 4 for chronic patients); 22 were health centers with beds; 85, health centers without beds; and 482, health posts.

In 1987, there were 4,904 hospital beds, of which 485 were in health centers with beds, 3,997 in hospitals for acute patients, and 422 in hospitals for chronic patients. Hospital beds declined as compared to previous years, mainly due to the closing of 227 beds for chronic patient care; this was offset by bed increases in acute care hospitals and in health centers with beds. A new hospital is being established in Managua. The number of beds per 1,000 population decreased from 1.7 in 1983 to 1.42 in 1988. However, the available beds do not yet yield their full potential in discharges; this is associated with the health service's efficiency.

Health Services Technologies

The development of diagnostic and therapeutic support services has been slowed by both the diversity of brands in use and the obsolescence of some radiology and clinical laboratory equipment, as well as by obstacles for importing equipment, particularly after the trade embargo. Furthermore, limited repair and preventive maintenance have led to the faulty operation of some units. The country has 73 operating rooms, 182 complete sets of dentistry equipment, 99 sets of radiology equipment,

TABLE 7

| Selected indicators in hospital establishments, Nicaragua, 1981 and 1985-1988. | | | | | |
|--|------|------|------|------|-------|
| Indicator | 1981 | 1985 | 1986 | 1987 | 1988* |
| Percentage occupation | 71.0 | 65.5 | 67.5 | 69.0 | 70.8 |
| Average length of stay (days) | 6.2 | 5.8 | 5.8 | 5.6 | 4.77 |
| Bed turnover | 40.3 | 39.3 | 43.8 | 45.5 | 47.7 |

*Preliminary data.

Source: DINEI-Ministry of Health.

125 clinical laboratories, 6 pathology laboratories, 6 blood banks, and 31 blood transfusion services.

The national industry produces 40% (approximately 50 products) of the drugs required by the health system; however, the industry relies on imports of raw materials and inputs for production. The problem in importing certain products has been partially solved through trade within Central America as a part of the agreements entered into by the Ministers of Health. However, this remains a critical problem for the country.

Financing of the Health Services

The Ministry of Health expenditures account for 95% of all expenditures made by the SNUS health services. No information is available on the total expenditures of the SNUS.

The Ministry of Health has two types of financing sources: regular expenditures from the general national budget and extrabudgetary resources from international and nongovernmental agencies. In 1985, 99.1% of total expenditures came from the national budget and 0.9% from extrabudgetary sources; in 1987, 97.9% came from the budget and 2.1% from extrabudgetary sources. This illustrates the margin of flexibility for guaranteeing the health services' operations.

While Ministry of Health expenditures as a percentage of the national budget increased from 7.85% in 1985 to 10.87% in 1988, these figures were lower than those for 1981 (13.2%). Ministry of Health expenditures came to 6.02% of GDP in 1985, 7.03% in 1986, and 7.77% in 1987; the 1987 figure was the highest for the decade.

The breakdown of expenditures has changed with the rationalization measures that have been adopted. Expenditure restrictions have been applied to investments, which represented 5.6% of the Ministry's budget in 1985, 1.8% in 1986, and 3.25% in 1987.

Although the foreign exchange spent on essential imports for the Ministry of Health services declined from \$US54.6 million in 1985 to \$US23.0 million in 1988, the acquisition of some critical supplies has been ensured.

Per capita expenditures of the Ministry's services (in

constant 1980 cordobas) was 395, 444, 487, and 480, from 1985 to 1988. The 1988 figure was \$US48 per capita (in constant 1980 values), which is less than the \$US50 figure for 1982.

Given the inflation affecting the country, the budget is insufficient.

Human Resources

The Ministry of Health's work force came to 15,792 in 1980, increasing to 23,176 in 1986, and to an estimated 21,310 in 1987. In 1980, 53.1% were administrative and general services personnel, while the rest were health personnel involved in providing direct care to the population. In 1986, the administrative and general services personnel were reduced to 41.0%; it is estimated that in 1987 the reduction was 24.3%, which made it possible to strengthen direct care services. The percentage distribution of the work force in the Ministry of Health in 1986 was as follows: 7.8% were physicians; 1.5% were interns; 1.3%, dentists; 5.0%, nurses; 19.1%, nursing auxiliaries; 24.3%, other technical personnel and health auxiliaries; and 41.0%, administrative and general services staff. Table 8 shows the ratios of different personnel categories per 10,000 population. In 1987, 70.5% of the health personnel was female, 46.4% were 20 to 29 years old, and 29.1%, 30 to 39 years old.

The percentage of personnel devoted to direct care has varied as a result of multiple causes, such as low wages, the stress from the war, and the transfer to other areas of the economy. In 1987, 14.4% of physicians were practicing professionals (interns), 23.2% were fulfilling their social service, 14.3% were acquiring specialties, 15.4% were general practitioners, and 32.6% were medical specialists. This means that 52% of all physicians have fewer than five years of experience. In 1987, the ratio of nursing personnel to physicians was 1.99; that of professional nurses to physicians, 0.59; and the ratio of nursing auxiliaries to nurses, 3.36.

The Ministry of Health has a network of 13 teaching units for training high- and mid-level technical personnel and auxiliaries in different branches of medicine. In 1985,

| Type of personnel | 1982 | 1985 | 1986 | 1987 | 1988 |
|-------------------|------|------|------|------|------|
| Physicians | 6.7 | 5.25 | 5.15 | 5.4 | 5.5 |
| Dentists | 0.65 | 0.76 | 0.84 | 0.79 | 0.75 |
| Nurses | 2.7 | 2.8 | 3.20 | 3.3 | 3.24 |
| Nurse auxiliaries | 14.0 | 12.5 | 11.9 | 11.1 | 11.3 |

Source: Office for Organization of Services, Ministry of Health.

949 new professionals were trained; in 1986, 853; and in 1987, 1,018. Although all were incorporated into the services, there are not enough medical professionals to keep up with the rate of population increase.

Graduate-level training is available in 19 specialties; in 1987, 120 new specialists graduated, and in 1988, 123.

HEALTH AND THE ENVIRONMENT

At the triumph of the revolution, sanitary conditions were poor in the cities and the rural areas virtually had no coverage. Although investments were channeled to improve this situation, especially regarding water supply, sustained population growth and the continual migration to the main urban centers have put more pressure on these services. Other factors such as the war, the economic crisis, and the consequent limitations on the country's ability to solve the problem, led to a marked deterioration in sanitary conditions.

The country has a wealth of water resources: in addition to vast aquifers, it has 30 lakes, 24 major rivers, and 78 secondary rivers. Currently, there are 145 water supply systems, administered by the Nicaraguan Institute of Water Supply and Sewerage Systems (INAA), which are supplied by approximately 293 reservoirs; 65% of the sources are groundwater; 2.3%, surface; and 2.7%, sub-surface.

In 1985, 48% of the population had water supply for human consumption (76.1% of the urban population and 11.0% of the rural). It is estimated that in 1988 coverage was 51% (77.1% for the urban population and 14.5% for the rural).

The country has only three water treatment plants, two of which have problems with operations and efficiency; only 2.4% of the sources have disinfection units. Currently, three treatment plants are under construction. In most cases, the quality of water supplied is not satisfactory.

The insufficient coverage and intermittent supply of some water sources have led to the adoption of inadequate water supply practices on the part of the population. Of the sources, 42% provide limited quantities of water. In addition, most of the systems are outmoded

and plagued by shortcomings in operations and maintenance.

For excreta and wastewater disposal, there are 19 municipal sanitary sewerage systems located in the country's principal cities; six were built in 1970 and the rest in the 1950s. Most of the sewerage systems have very low coverage; only nine have treatment units (stabilization ponds) and, in general, they function poorly. The coverage of sewerage systems ranges from 6% to 61%. Coverage of sanitary sewerage services is 35% in urban areas and 20.5% nationwide. The programs for supplying latrines are insufficient, and at present it is not known how many people have sanitary latrines.

Industrial wastewaters are not adequately treated prior to final disposal.

The management and final disposal of solid wastes are unsatisfactory. The basic problem is the garbage collection service; only 56% of the municipalities have collection systems, leading to a proliferation of unauthorized dumps. No method of treatment or of recovery and recycling of the wastes is used. In 86.7% of all cases, final disposal is done at unauthorized sites; only Managua uses covered sanitary landfills. The storage, collection, transportation, and final disposal of dangerous solid wastes are not subject to separate and special handling.

Regarding food protection, there are unsanitary conditions in facilities that produce and process food, at food distribution centers, and at the municipal slaughterhouses. The technology for producing and processing food also is inadequate.

Despite the country's current situation, environmental problems are being addressed through an intersectoral and comprehensive approach. A community sanitary plan, with the participation of municipal governments and popular organizations, has been implemented in each locality.

This plan involves carrying out permanent campaigns for waste disposal by sanitary landfills, burial, or incineration; the supply of latrines; the improvement of sanitary conditions in the markets, municipal slaughterhouses, food distribution centers, schools, health units, and production centers; and activities to protect water sources and deposits.

PANAMA

GENERAL CONTEXT

Political, Economic, and Social Situation

According to the Constitution currently in effect, the Republic of Panama is a unitary, republican, democratic, and representative State.

Important political, social, and economic events curtailed investments and activities in national health plans. The 1989 national elections ended in confusion: in the midst of denunciations of electoral fraud and accusations among the participants, the elected officials could not take office. Mediation efforts by the Organization of American States and other entities failed, and the Armed Forces increasingly took over the national administration. In the context of serious accusations of illegal activities, particularly by the higher echelons of the military, and severe economic, military, and political pressures from the United States of America, the military Government became progressively isolated from the international systems as it confronted one of the worst economic crises in the country. Uprisings within Panama's Armed Forces, a growing deterioration in the relations with the United States, political isolation, and the economic blockade further eroded efforts to stabilize the national economy.

A marcoeconomic analysis highlights two periods during this quadrennium. During the first, from 1985 to 1987, economic growth, fanned by the agricultural and livestock sectors, outpaced population growth. In 1987 alone, economic growth in terms of the previous year's gross domestic product (GDP) was 2.9%. However, by the end of 1988, a severe economic deterioration began, marking the onset of the second period.

A total paralysis of the country's banking system for more than two months, the freezing of National Bank of Panama funds held in United States banks, the suspension of exports to the United States, and the Government of the United States' holding of payments for Panama Canal operations severely deteriorated the country's economy and prevented an effective assessment of changes in the overall economic indicators.

An analysis of macroeconomic aggregates shows that exports, both in goods and services, have been the least affected, while investments have been hit hardest. Consumption dropped because consumers experienced dif-

ficulties in conducting their transactions (commercial establishments stopped accepting personal checks or credit cards). Regarding the agricultural sector, the most affected area has been livestock-raising because of reductions in the consumption of meats, milk, and eggs.

Data from 1982 and 1988 household surveys show that the proportion of unemployed in the economically active population aged 15 and over has increased. In the metropolitan area, unemployment was 5.5% in 1982 and 12% in 1988.

According to the 1980 census, illiteracy in Panama was 13.2%. This figure ranged from 50.6% in the Region of San Blas to 5.3% in the Province of Panama, where the country's economic activity is concentrated. In 1987, 88.3% of the schoolchildren attended government institutions; the remaining 11.7% attended private educational institutions. School attendance among children 6 to 17 years of age in 1987 was 77.7%.

During 1987, approximately 98 of every 100 children enrolled in school completed the primary level of their formal education. School retention at this level reached 62% during 1982-1987. In 1987, the dropout rate at the middle level was 5% of initial enrollment. On the other hand, approximately 40,000 students graduated at this level in 1987; of these, 46% (18,400) completed secondary school and thus were among those putting pressure on the labor market as they searched for their first jobs.

Ninety-two percent of the enrollment in higher education centers was at the two state universities.

Nonformal education represents 9.3% of the system's overall enrollment. In 1987 the greatest increases in nonformal enrollment over the previous year were in pre-school education (6.1%). In the public schools the increase was 11.3%. In addition, enrollment in literacy training and adult education rose by 9.7%.

In 1987, public spending for education rose 7.7% over 1986, reaching about B305 million, or 8.4% of the total public spending for that year.

The housing problem, especially among the poorest groups, is rooted in structural economic conditions. The fiscal crisis and insufficient liquidity in the national treasury have hindered the implementation of plans designed to meet the pressing health, education, labor, and housing needs of the most vulnerable segments of the population.

The Ministry of Housing estimates that 1.1 million

inhabitants lack adequate housing. According to the most recent studies, there are 263 "squatter settlements" where 49,200 families live. Seventy-five percent of these families are in the Province of Panama. In rural areas, the structural and sanitary conditions of the dwellings are deplorable.

Demographic Characteristics

Official estimates put Panama's population in 1987 at 2,274,000, with a growth rate of 2.1%.

Fertility is predicted to decrease from 3.5 children per woman for 1980–1985 to 3.1 for 1985–1990, with significant variation among the provinces. It is estimated that mortality also will continue to decline, dropping from 5.4 to 5.1 per 1,000 population. However, there are provinces, such as Bocas del Toro and Veraguas, which continue to have death rates of 8 and 7 per 1,000 population, respectively.

Infant mortality also shows a downward trend, dropping from 26 to 23 per 1,000 live births for the years in question, although it remains high in the least developed provinces such as Darién, Bocas del Toro, and Veraguas, with 51, 39, and 32 deaths per 1,000 live births, respectively. Life expectancy at birth increased from 71 to 72 years during the same period. The latter figure ranges from 61.9 in the Province of Darién to 73.6 in Los Santos.

The metropolitan areas of Panama and Colón receive most of the migrants from other provinces. In 1987, 52.8% of the country's total population was concentrated in these areas, with a population density of 70.7 inhabitants per km² (86.3 in Panama and 32.9 in Colón); the provinces of Bocas del Toro and Darién registered densities of 8.7 and 2.3, respectively.

A rising trend can be seen in the median age of the population, which went from 18 years in 1970 to 21 in 1985; it is expected to reach 22 years by 1990. Over the medium term, the growth of the economically active population will call for more dynamic approaches in economic activity in order to slow the rate of unemployment. This aging of the population is most obvious in the Province of Los Santos, and is the result of declining fertility and migration of young people to other provinces.

In 1987 the population living at the poverty level was estimated at 33.6% (700,000 inhabitants), according to an indicator from the Ministry of Planning and Economic Policy which considers housing conditions (60%), direct municipal taxes per capita (15%), the number of persons per privately owned automobile (15%), and infant mortality (10%). It is estimated that as a result of the current crisis the limits of this indicator will fluctuate between 36.9% and 44.6%; in other words, from 800,000 to 1,000,000 Panamanians will be affected. Approximately

half the population not covered by public health services lives in the city of Panama and its outlying areas, where the annual population growth rates exceed 4%, exacerbating the shortage of services.

According to preliminary studies conducted by the Ministry of Planning and Economic Policy, the crisis that the country faces could reduce the GDP by 15% to 20%, which would generate unemployment rates of around 17%—higher rates than the 11.6% expected had the crisis not occurred. It is estimated that during 1988 nearly 100,000 salaried workers were expelled from the modern sector of the economy.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

General mortality during the 1980s has been about 4 per 1,000 population per year. Infant mortality experienced a downward trend, from 21.7 per 1,000 live births in 1980 to 19.4 in 1986. However, there are differences between urban and rural areas: in 1986, infant mortality was 20.5 per 1,000 live births in rural areas and 18.1 in urban areas (Table 1).

Certification of deaths is lower in rural than in urban areas, a fact that must be considered in the following analyses. In 1986 the proportion of medically certified deaths was 98.2% in the cities and only 64.3% in the rural areas, and in children under 1 year of age the rates were 99.6% and 74%, respectively. These percentages mask variations in the different regions of the country, especially in those where the Indian population lives.

The decrease in infant mortality led to a two-year increase in life expectancy, which rose from 70.1 in 1980 to 72.2 in 1988. Life expectancy is higher for women than for men, and lower in rural than in urban areas (Table 1). During 1995–2000, only two provinces, Panama and Los Santos, are expected to exceed the national average life expectancy of 73.3 years.

The leading causes of death for 1982 and 1986, excluding the 8.2% of deaths registered as ill-defined conditions, were malignant tumors, accidents, suicides, homicides and other violent acts, cerebrovascular diseases, acute myocardial infarction, and certain conditions originating in the perinatal period.

Health Situation of Specific Population Groups

The Government of Panama considers the following groups as priorities, and, within each group, those who live in extreme poverty: children under 1 year of age;

TABLE 1

Vital indicators by urban and rural areas,
Panama, 1980 and 1986.

| Indicators | 1980 | 1986 |
|-------------------------------------|------|------|
| Birth rate ^a | 26.9 | 25.9 |
| Urban | 26.3 | 23.7 |
| Rural | 27.4 | 28.2 |
| Overall mortality ^a | 4.1 | 4.0 |
| Urban | 4.2 | 4.1 |
| Rural | 4.0 | 4.0 |
| Infant mortality ^b | 21.7 | 19.4 |
| Urban | 19.4 | 18.1 |
| Rural | 23.9 | 20.5 |
| Neonatal mortality ^b | 12.0 | 11.5 |
| Urban | 12.7 | 13.2 |
| Rural | 11.4 | 10.0 |
| Postneonatal mortality ^b | 9.7 | 7.9 |
| Urban | 6.7 | 5.0 |
| Rural | 12.5 | 10.5 |
| Maternal mortality ^b | 0.7 | 0.6 |
| Urban | 0.2 | 0.3 |
| Rural | 1.1 | 0.9 |
| Natural growth | 22.8 | 21.9 |
| Urban | 22.1 | 19.6 |
| Rural | 23.4 | 24.2 |
| Professional care at delivery (%) | 79.5 | 84.2 |
| Urban | 98.8 | 99.3 |
| Rural | 61.2 | 70.8 |
| Life expectancy (years) | 1980 | 1989 |
| Total | 70.1 | 72.2 |
| Male | 68.4 | 70.2 |
| Female | 71.9 | 74.2 |
| Urban | 72.9 | 74.1 |
| Male | 70.9 | 71.8 |
| Female | 75.1 | 76.6 |
| Rural | 67.5 | 69.9 |
| Male | 66.3 | 68.6 |
| Female | 68.6 | 71.5 |

^aRate per 1,000 population.^bRate per 1,000 live births.

children aged 1 to 4; pregnant women; adolescents and young adults at greatest risk for sexually transmitted diseases, drug addiction, and accidents; and persons over age 65.

Child Health

After rapid declines in the 1970s, both infant mortality and neonatal and postneonatal mortality declined only slightly during the 1980s. Neonatal mortality dropped from 12.0 to 11.5 per 1,000 live births between 1980 and 1986; postneonatal mortality went from 9.7 to 7.9; and infant mortality, from 21.7 to 19.4.

In 1986 only 2.7% of attended live births were premature. In full-term pregnancies, low birthweight (under 2,500 g) was 7.5% for live-born females and 6.1% for males. For births with an unspecified gestation period, the figures were 9.0% for males and 7.1% for females. The leading cause of death in newborns is "hypoxia, birth asphyxia, and other diseases of the fetus or newborn." In urban areas, the death rate from this group of causes is 62.6 per 10,000 live births, compared with 32.7 per 10,000 live births in the rural areas. The second most important cause in urban areas is septicemia of the newborn, which suggests a serious problem with nosocomial infections. In rural areas, the second cause is ill-defined intestinal infections, which ranked eighth in urban areas. Slow growth, malnutrition, and immaturity ranked fifth in the cities and sixth in the rural areas. Pneumonias stood in fourth place in the rural areas and in eighth place in the cities.

The health system stresses immunization programs, which in 1987 achieved high average coverage in children under 1 year (figures in parentheses represent ranges of coverage in the provinces): 72.5% for DPT (41.6%–83.1%); 74.6% for polio (43.9%–83.9%); 78.0% for measles (58.4%–94.3%); and 89.9% for BCG (62.9%–100.0%).

In 1986, mortality in children aged 1–4 was 15.4 per 10,000. Deaths from nutritional deficiencies and anemias represented 10% of all deaths in this group. It is expected that malnutrition will increase, given the consequences of the country's economic crisis. The leading cause of death in this group is ill-defined intestinal infection; the second is accidents and violent acts (more than 12% of the total).

In children aged 5 to 14, the main cause of death is accidents and violent acts (23%), particularly motor vehicle accidents and accidental drowning and submersion, which represent 17% of all deaths. Another major cause of death is ill-defined intestinal infections, followed by diseases of the central nervous system. Neoplastic diseases, leukemias, and malignant tumors represent 5.9% of the total. It should be noted that pneumonia and measles rank sixth and seventh as causes of death, and that morbidity figures already show the effects of drug addiction and sexually transmitted diseases. According to preliminary data from a survey on the prevalence of malnutrition (weight-for-height) in first grade school-

children, 24.4% were malnourished (18.6% moderately malnourished and 5.8% seriously malnourished).

Health of Adolescents and Adults

Accidents and violent acts constitute the leading cause of death in this group (32.3%). In 1986 motor vehicle accidents topped the list with a rate of 20.3 per 100,000 population. Following in relative importance are cerebrovascular diseases, neoplasms, and acute myocardial infarction. Degenerative diseases, hypertension, and diabetes mellitus are beginning to gather importance.

Health of the Elderly

The main causes of death in this group are cerebrovascular diseases, acute myocardial infarction, other ischemic heart diseases, and neoplasms. It should be noted that among persons aged 75 and older, pneumonia ranks fifth among the causes of death.

Problems Affecting the General Population

The events which have generated the greatest concern and have triggered decisions on the part of the Government and the population are: the presence of AIDS; reinfestation by *Aedes aegypti*, which transmits dengue and yellow fever; and the effects of Hurricane Joan on the provinces of Chiriquí and Veraguas, where part of the installed capacity was destroyed.

As of 8 August 1988, 64 cases of AIDS had been diagnosed in Panama, and there were 320 confirmed seropositives. Eighty-five percent of the patients were male. As of the above date, 42 persons had died of the disease. Most cases were in the 20–44-year age group (92%); 62% of the cases were from sexual transmission, 18% from blood transmission, and 5% from mixed transmission; only one case of prenatal transmission was detected.

Panama's position as a crossroads places it at risk for different diseases and vectors that are not customarily found in the Central American Isthmus. In 1988 Panama received a cargo of used tires from abroad in which *Aedes aegypti* larvae were found.

All urban areas experienced an explosive reinfestation by the mosquito, which reached prevalence levels of more than 5% in investigated dwellings. Given dengue's behavior in other countries of the Central American subregion, this situation has placed Panama at imminent risk of an epidemic of the disease.

Health authorities, aware of this threat, have not spared efforts to promote and establish a surveillance and control plan in which the organized community works together with state and private organizations.

In October 1988 the country was buffeted by Hurricane Joan, which seriously damaged the health services of the provinces of Chiriquí, Veraguas, Los Santos, Herrera, Darién, Colón, and Bocas del Toro. Damages were estimated at as much as B1.8 million, due to the destruction of health posts and centers, latrines, excavated wells, rural water supply systems, and critical supplies and equipment in some health installations. In addition, total and partial losses of crops and animals have adversely affected food availability.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

The current constitution establishes that it is an essential function of the State to safeguard the health of the population, and that each individual not only has a right to health but also the duty to preserve it. The constitution also envisions that the delivery of services be carried out within a comprehensive approach to health, taking into account both preventive and curative aspects. In addition, the policy of technical and administrative reform calls for an integration of government health sectors, including autonomous and semiautonomous state institutions (the Ministry of Health and the Social Security Fund). The community's participation in the planning, execution, and evaluation of health activities and programs is also considered a right and a duty.

The constitutional mandate calling for the integration of the governmental health sectors began to be implemented in 1973. Currently, this process extends to eight of the nine provinces; up to now, it has been impossible to include the Province of Panama, particularly the metropolitan area. The metropolitan area has many public health care institutions that are granted excessive autonomy in defining policies on health service coverage and delivery. This explains why the metropolitan area suffers from problems such as population groups with double or triple coverage, institutions managed by two administrations, employees holding more than one job, concentrations of idle human resources that result in low production and productivity, and poor utilization of installed capacity.

Under the prevailing laws, the Social Security Fund, which was created in 1941, has established policies and strategies aimed at reaching universal coverage. In 1985 the covered population reached 59.8% of the total population and, according to estimates, by 1987 it had reached 64.5%, with an average annual growth rate of

3%. It should be noted that the percentage of the contributing population to the total covered population remains at 37.4%.

The rapid improvements in the country's health indicators seen in the last 20 years are rooted in the active and deliberate participation of the organized community in the development of health programs. This participation has been achieved through a strategy called "Living with the Community." This strategy is part of the national approach, "The People and the Government—a Team," whereby the health team and the community work together toward health promotion.

The country is divided into 11 regions, or integrated health systems, which, in turn, are divided into health areas that are further broken down into health sectors. There are 1,000 communities organized into health committees, and these committees are grouped into federations.

Production of Services

In the public sector the number of hospital beds remained relatively constant (6,100 registered in 1986 and 6,165 in 1987). There were 171,181 hospital discharges in 1986 and 181,780 in 1987. The rate of hospital discharges per 100 inhabitants remained stable during 1983 and 1987, 6.4 and 6.7, respectively. For 1988, preliminary figures indicate a drop to 5.9. This average value masks marked irregularities: although for the metropolitan region the estimated rate for 1988 was 8.9 and for the Region of Azuero, 9.4, for the Province of Darién the rate was 2.6 and for the Region of San Blas there were only 1.8 hospital discharges per 100 inhabitants.

Bed turnover increased from 28.7 discharges per bed in 1986 to 29.5 in 1987; occupancy rates also rose from 77.6% to 87.2%. The average length of stay decreased, from 9.4 days per hospital discharge in 1986 to 8.7 in 1987.

The Azuero Regional Hospital, in the province of Los Santos, accommodates long-term psychiatric patients, which might help explain why that province registers such low bed turnover (13.9 discharges per bed). This observation also applies to the metropolitan area, where the National Psychiatric Hospital is located.

From 1983 to 1987 the number of beds in the private sector increased by about 20% (from 754 to 1,016). Occupancy rates, including in nurseries, fluctuated between 45% and 42% from 1983 to 1987, except in 1985, when they peaked at 49%. The average number of days per stay was fewer than five.

Between 1983 and 1987 there was a steady increase in medical consultations (from 5,439,756 in 1983 to 5,977,713 in 1987). In 1988, according to preliminary data, there were only 4,865,104 consultations, a fact that

is consistent with the reduced production of health services that year as a consequence of the country's overall situation. This reduction was most obvious in San Blas, Azuero, Panama East, and the metropolitan area.

The average number of medical consultations per inhabitant remained steady between 1983 and 1987, when 2.60 and 2.63 consultations per inhabitant were registered, respectively; in 1988 this average declined to 2.0. In 1980 a total of 365,000 nursing care services were provided, and in 1987, 620,000. Dental consultations increased from 527,000 to 701,000 during that same period. This increase, however, was not observed in all the health regions: for example, the figures for Bocas del Toro, Colón, and Darién fell slightly in absolute terms.

Different health regions or provinces show differences in the pattern of dental care. According to 1987 data, in six regions second consultations exceeded first consultations in absolute numbers; in three regions these values were similar; and in three (Darién, Herrera, and the metropolitan area) the number of second consultations was about half that of first consultations. This stems from factors such as the specific morbidity in each region, the installations' capability to resolve problems based on their equipment and critical supplies, and differences in the characteristics of professionals providing the services.

Installed Capacity

The number of hospitals, health centers, health centers with beds, polyclinics, dispensaries, and health posts increased between 1976 and 1987. The number of hospitals rose from 29 to 35; health centers, from 76 to 110; and Social Security Fund polyclinics, from 19 to 24. Dispensaries and health posts increased from 212 in 1981 to 428 in 1987. Of the country's 35 public hospitals in 1987, 8 were specialized hospitals, 14 were general hospitals, and 13 were general medicine hospitals. The specialized hospitals operate in the provinces of Chiriquí, Herrera, Los Santos, and Panama. During 1983–1987 the number of private-sector hospitals increased from 15 to 19.

Health Services Technologies

Panama has no defined policy on producing, introducing, modifying, and utilizing appropriate technology according to the country's needs. Panama cannot produce enough drugs nor assure their adequate quality. Moreover, the national laboratories' installed capacity is inefficiently utilized. Save for a specialized analysis laboratory, the country does not have the capability or the resources to ensure a continuous surveillance of the physical, chemical, and biological quality of the drugs and nutrients consumed by the population.

Panama has 17 blood banks located throughout the country, except in the Province of Darién and the Region of San Blas. According to a January 1989 preliminary report, there are 93 radiological units, found mainly in the metropolitan area (25) and in the regions of Chiriquí (17) and Azuero (13). All the integrated health systems or regions have at least one radiological unit.

Financing of the Health Services

Health expenditures are essentially financed by the Ministry of Health and the Social Security Fund. As a result, the main financing sources for the health system are the central government's current earnings, employer-employee contributions to the Social Security Fund, extraordinary funds received through loans, and donations from public and private international agencies. The income generated from the health services provided to the community is also extremely important (Hospital Administration Fund); it is estimated that these funds have fallen by 40% as a result of the current crisis. Assistance for critical supplies provided by the international community, mainly during 1987 and 1988, also deserves mention.

Until 1986 the Ministry of Health's and the Social Security Fund's budgets for operating expenses and investments represented 5% of the GDP. However, this figure has rapidly shrunk due to the economic crisis.

An analysis of financing sources shows that during 1986, 1987, and 1988 neither the Ministry of Health nor the Social Security Fund had budgetary increases (in health-related areas). The budgets only have permitted delivery of minimum basic services, and any expenditures for new investments, equipment maintenance and repair, or infrastructure have been postponed. The freezing of financing for investment projects that were negotiated with the international lending agencies (IDB, IMF, etc.) has delayed construction of the San Miguelito Hospital, the transformation of 21 health posts into health centers, the remodeling and restoration of installed capacity for 14 hospitals in the different regions of the country, and the extension of drinking water supply and sanitation services to approximately 50,000 persons.

The Ministry of Health's 1989 draft budget is on the order of B110 million, which means an increase of B17 million (18.3%) over the 1988 budget. The most important line item is personnel, which represents around 65% of the budget.

Health Planning and Administration

Local health systems have been evolving to the point where today they are defined and formally established.

In 1983, a study was conducted on updating the health services within the primary care framework; the study's strategic elements were: accessibility and coverage of the health services, the establishment's resolution capability, the sector's managerial organization and update, and the population's poor socioeconomic and cultural conditions. The regions redefined their sectors based on this study.

The types of structures found in the regions parallel those of the respective health sector headquarters, which may be a health center, a polyclinic, or a general hospital. In order to begin the gradual implementation on a national scale, Panama has adopted the local health systems strategy as a pilot experiment in the Western Panama health region. This process targeted five working areas with the three components of local health systems: health situation of the population, organization of the programs, and the health services.

Human Resources

During the 1970s there was an increase in human resources training based on the policy of expanded health coverage and the strategy of integration and community involvement. During the 1980s the number of professionals and technicians rose significantly (Table 2). Nevertheless, personnel continue to be concentrated in the urban areas. Some areas in Panama are not covered by health services, and others, such as the metropolitan area, have a significant concentration of human and financial resources.

Of the 2,722 physicians counted in 1987, 2,452 worked in public institutions and 270 practiced exclusively in private organizations. Of the 2,722 physicians, 1,442 (53.0%) were specialists. Of 2,456 nurses who worked in the country in 1987, 2,184 worked in the public sector.

HEALTH AND THE ENVIRONMENT

The Ministry of Health and the National Institute of Water Supply and Sewerage Systems (IDAAN) are responsible for promoting and conducting basic sanitation activities. Regarding drinking water supply, the Ministry of Health serves populations of 500 or fewer inhabitants. In 1987, the population covered by IDAAN was estimated at 1.54 million. The population with access to drinking water through the Ministry of Health and IDAAN increased from 82.1% in 1976 to 84.8% in 1986, and the population served with drinking water connections increased from 59% to 70.2% during that same period.

The sanitary disposal of excreta represents a problem both in the rural areas and in the poverty belts of the

| Human resources | 1980 | | | 1987 | | |
|-------------------------------|-------|-------|-------|-------|-------|-------|
| | Total | Urban | Rural | Total | Urban | Rural |
| Physicians | 9.3 | 17.0 | 1.7 | 12.0 | 20.1 | 3.2 |
| Nurses | 7.6 | 14.1 | 1.3 | 10.8 | 18.2 | 2.8 |
| Dentists | 1.4 | 2.4 | 0.4 | 2.3 | 3.4 | 1.0 |
| Laboratory workers | 3.1 | 5.9 | 0.4 | 3.4 | 5.9 | 0.7 |
| Medical radiology technicians | 0.8 | 1.6 | 0.1 | 1.4 | 2.4 | 0.2 |
| Nursing auxiliaries | 14.9 | 26.4 | 3.7 | 16.4 | 26.1 | 5.9 |

Source: Department of Statistics and Planning, Ministry of Health.

principal cities, where it is still necessary to construct latrines since there is no access to the sewerage system. However, 85% of the total population has a sanitary system for excreta, with 98% coverage in the cities and 75% in the rural areas.

In Panama City, the fecal contamination of Panama Bay poses a serious problem, which can only be solved by building a wastewater treatment plant. In addition, some rivers are contaminated with industrial wastes and insecticides used for vector control.

At those times of the year when the wind dies down,

high temperatures and humidity contribute to the capital's serious air pollution problem.

Panama's trans-isthmian oil pipeline and its oil refinery expose the country to potential coastal pollution and to the destruction of its flora and fauna, such as the 1988 incident in a Province of Colón refinery.

The cities of Panama and Colón have problems with the collection, transportation, and final disposal of solid wastes, which have been partially solved by transferring the garbage dump from its location in Old Panama to Cerro Patacón, where a landfill method is being used.

PARAGUAY

GENERAL CONTEXT

Political, Economic, and Social Situation

The Constitution which has been in effect since 1967, establishes Paraguay as a unitary republic with three branches of Government: the executive branch is constituted by the President of the Republic; the legislative branch is represented by a bicameral Congress, which comprises a Senate and a Chamber of Deputies; and the judicial branch is made up of a five-member Court of Justice and the tribunals and courts established by law. The executive branch's advisory body is the Council of State. The affairs of State are under the responsibility of the executive branch's Ministers, who carry out the actions taken by the President of the Republic.

The country is administratively divided into 19 departments, which are under the responsibility of government delegates: 14 are in the Eastern Region and 5 are in the Western Region. The departments are divided into districts, which, in turn, are subdivided into *compañías* and *colonias*.

After the February 1989 coup d'état and the subsequent installation of a democratically elected government, the country began a return to a constitutional framework. The proclamation issued by the new authorities, which is based on strengthening the constitutional framework, the democratization of the Government's political party, emphasizing public responses to social demands, and holding new elections for a single-term president in 1993, characterizes the current Government as one of "democratic transition." With these fundamental tenets, the country has entered a new stage of political effervescence that features a representation crisis in the traditional power groups, the emergence of new political parties, and a growing capability for making social demands as citizens recover their rights. As a reflection of the democratic transition, the Parliament has become the forum for dialogue, although discussions within the political parties have been given priority.

According to an analysis of the public policies contained in the 1989–1990 Economic and Social Development Plan, the country's priorities will be to foster private investments in the agricultural export sector and to balance the Treasury budget by reducing the overall

deficit through increased levies and by rationalizing public expenditures through the transfer of enterprises to the private sector.

Public investment efforts will focus on modernizing transportation systems to facilitate the export of agricultural products, supporting a moderate agrarian reform, and promoting an administrative decentralization. Regarding health, a process is under way to redefine policies that deal with the extension of the services' coverage, the implementation of idle installed capacity, and the establishment of health care programs to serve marginal and priority groups.

The gross domestic product (GDP), which was 560.45 billion guaranis in 1980, has steadily increased to 3,432.94 billion in 1988, representing a real increase (cumulative annual growth) of 25.4% in these eight years. In dollars at the official exchange rate, the GDP increased from \$US4.45 billion to \$US4.90 billion in the same period (an increase of 1.2%). The devaluation of the guarani explains the difference between the percentage increase in guaranis and that in dollars at the official exchange rate. From 1983 to 1988, the GDP expressed in dollars at the floating exchange rate rose from \$US2.64 billion to \$US3.84 billion (for a real annual increase of 7.8% in those five years), and per capita income in floating dollars rose from \$US760 to \$US960 (a real increase of 4.8%).

An analysis of the GDP by sectors shows the primary sector's significant contribution of 25% to the productive system; secondary-sector production, which remains rudimentary since small and medium industries predominate, accounts for 23.0%; and the service sector, which demonstrated greater activity, accounts for 52%. This greater contribution was mainly due to the government's focus on the basic services sector, such as transportation and communications, as a way to bring about the integration of the national territory. Of the other services, the greatest contributions to the GDP are from trade and finance (4.0%) and housing (3%), which together grew at a cumulative annual rate of 3.4% from 1984 to 1988.

In 1987, the gross external debt came to \$US2.04 billion (98% of which corresponded to the public sector and 2% to the private sector). Paraguay, with an external debt of \$US510 per capita in 1987, has one of the smallest relative debts among Latin American countries.

Exports rely on agricultural products, especially soy-

beans and cotton, which for some years of the 1980–1987 period accounted for more than 80% of total exports. In 1987, imports came to \$US517,476,000; when compared to the \$US517,141,000 figure for 1980, the former reveals the stagnation due to the exchange rates in that period.

The 1982 population census shows that 46.6% of the economically active population worked in the agricultural and livestock sector; 13.3% in industry; 10.6% in trade and finance; 6.9% in construction; 3.1% in non-basic services; and 19.5% in the “others” category, and considered to be underemployed. Unemployment stood at 4.4%.

The educational system has developed significantly in recent years, as manifested by the decrease in illiteracy, the increase in school enrollment in the population 7 to 14 years old, the increase in educational levels, and the growth of the educational infrastructure. From 1962 to 1980, illiteracy rates dropped from 25.49% to 18.19%. In 1983, 77.5% of the population over 10 years old knew how to read and write; of these, 51.2% were men and 48.8%, women. Of the literate population of both sexes, 54% resided in rural areas and 46% in urban areas. Of the literate population in the rural areas, 51.8% were men and 48.2% were women, while in the urban area 47.6% were men and 52.4%, women.

According to the 1982 census, there were 578,714 dwellings in the country. The breakdown by building material was as follows: in the cities, 73.1% were brick constructions and 19.1%, wood constructions; in the rural areas, 38.2% were made of wood, 25.8% were made of brick, and 25.8% were made of wood stakes.

Social security comes under the Social Security Institute, which provides coverage for disease, professional, and work-related risks (work-related accidents and occupational diseases of wage-workers) to its beneficiaries (workers, apprentices, staff of decentralized agencies, teachers, domestic workers in Asunción, veterans of the War of the Chaco, and some of the veterans' dependents). The health services provided by the Institute include medical and surgical care, dental care, pharmaceutical services, and hospitalization. Approximately 14% of the total population is covered by social security.

Demographic Characteristics

The country's population is approximately 3.9 million persons (1987 estimate), and the annual rate of population increase is 2.5%. The population is eminently young, and it is undergoing a slow process of aging. The percentage of the population under 15 years old decreased from 44.8% of the total in 1972 to 42.2% in

1982; by the year 2000 this age group is expected to account for 38.2% of the population. The population 15 to 64 years old increased from 51.2% of the total in 1972 to 54.9% in 1982. The elderly constituted 3.4% of the population in 1972 and 3.5% in 1982; it is estimated that this figure will rise to 3.7% by 1995–2000.

Life expectancy at birth for both sexes was 66.4 years in 1980–1985 (having increased from 65.6 years in 1970–1975 and 64.4 years in 1960–1965); for men it was 64.4 years and for women, 68.1 years. It is estimated that by 1995 it will be 67.3 years for both sexes and by 1995–2000, 67.7 years. The birth rate shows a tendency to decrease, having dropped from 47.3 per 1,000 population in 1950–1955 to 35.8 per 1,000 in 1980–1985. Estimated overall fertility for 1980–1990 is 4.6 children per woman, which is lower than the figure observed for 1980–1985 and 1970–1975 (4.8 and 5.7, respectively). If that trend holds, the rate will decline to 4.3 for 1990–1995 and to 4.1 for 1995–2000. The highest level of fertility by age groups is for women 25 to 29 years old, which characterizes Paraguay as a country with a late apex.

External migration has experienced two distinct periods: from 1950 to 1970, between 10.2 and 3.2 persons per 1,000 population emigrated; and from 1975 to 1985, 3.4 persons per 1,000 population immigrated. The latter trend coincided with the country's economic recovery as compared to the economic deterioration of neighboring countries such as Argentina and Brazil, which had been the main destinations for Paraguayan emigrants. Internal population shifts were accentuated in the 1950s, and were closely linked to progress in the network of roadways that fostered the development of settlements in Amambay, San Pedro, Upper Paraná, Caaguazú, and in a broad strip of the Department of Itapúa.

In 1982, population density was 7.4 inhabitants per km², but it varied substantially among the country's regions. For example, in the Western Region (Chaco) it was 0.2 inhabitants per km² and in the Eastern Region, 18.6 per km².

There is a sharp trend toward settlements in medium-sized urban areas. In fact, the proportion of population in localities with fewer than 25,000 inhabitants decreased from 84.1% in 1962 to 74.0% in 1982. Asunción, the capital, was the largest city in 1982, with 454,900 inhabitants (15% of the total population). Subsequently, the adjacent cities of Fernando de la Mora, Lambaré, San Lorenzo, and the urban area of Luque were joined to it, forming Greater Asunción, with 701,600 inhabitants (23.1% of the total population).

Women account for 51.6% of the population in the urban areas and 48.3% in the rural areas; this is because proportionately more women emigrate from the countryside to the cities.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

Underregistration of deaths was estimated at 40% in 1981, and decreased to approximately 30% in 1984. The percentage of medically certified deaths increased from 45.4% to 58.3% in those years.

Data from the Ministry of Public Health and Social Welfare presented in this chapter refer to the "reporting population" of that Ministry. Consequently, the analysis of these data reflects the status of the population covered by the Ministry, rather than that of the entire population. According to data from the Department of Biostatistics, the overall mortality rate decreased steadily from 1960 to 1987, dropping from 11.1 to 5.3 per 1,000 population.

Regarding causes of death, the epidemiological changes registered from 1960–1969 to 1980–1984 indicate that heart diseases moved from third to first place; cardiovascular diseases, from fifth to second place; neoplasms, from fourth to third; and acute respiratory infections from second to fifth place. According to a study of the 1982–1984 data, of the six leading causes, the group "certain diseases of the circulatory system" accounts for 27.7% of all deaths from defined causes. The second leading cause, responsible for 11%, is the category of diseases preventable by vaccination and acute respiratory infections; neoplasms account for 9.6%; intestinal infections for 8.2%; conditions originating in the perinatal period for 6.2%; accidents for 6.0%; and the rest for 31.3%.

An analysis by sex shows that the greatest difference is in accidents, which account for 8.2% of male deaths and only 3.5% of female deaths; this difference is greater in motor vehicle traffic accidents. Neoplasms are the second leading cause in women (11.2%); the most common sites are the breast and the cervix. In men, neoplasms rank fourth (8.1%), preceded by the category of diseases preventable by vaccination and acute respiratory infections and by accidents. The most common sites for neoplasms are the stomach, bronchus, and lung.

The lowest figures for deaths from ill-defined causes are in the Asunción area (6.3%) and the highest (30.2%) in the Eastern Central area.

A recent study covering deaths in the period 1982–1984, compared the percentage of deaths by groups of causes with the years of potential life lost (YPLL) as a result of deaths before 65 years of age. This analysis revealed that diseases of the circulatory system accounted for 27.7% of deaths due to defined causes and only 5.1% of the YPLL; diseases preventable by vaccination, 11.0%

of deaths due to defined causes and 17.3% of the YPLL; neoplasms, 9.6% and 4.0%, respectively; intestinal infections, 8.2% and 17.3%, respectively; conditions originating in the perinatal period, 6.2% and 15.6%, respectively; and accidents, 6.0% and 7.4%, respectively.

Health Situation of Specific Population Groups

Child Health

In 1962, it was estimated that only 40% of live births and 45% of deaths in children under 1 year old were registered on a timely basis; a significant omission in death registration persists.

Infant mortality data vary depending on the source consulted. According to the Latin American Center of Demography (CELADE), the figure for the 1955–1960 period is 68.7 per 1,000 live births, and shows a decline to 53.2 per 1,000 for 1975–1980. But according to the Department of Biostatistics at the Ministry of Public Health and Social Welfare, in 1980 the rate was 63.2 per 1,000 live births, and 40.3 per 1,000 for 1987. According to available data, infant mortality held steady from 1960 to 1976; since then, the tendency has been to decrease, dropping to 40.1 per 1,000 in 1986.

An infant mortality study carried out by CELADE from 1955 to 1980 (using indirect estimating techniques taking samples from the 1972 and 1982 censuses, from the national demographic survey of 1977, and from the 1979 national fertility survey) established clear differences among the metropolitan, eastern, and western health regions, which had average figures of 44, 59, and 71 deaths per 1,000 live births, respectively. The variables considered were the degree of urbanization, the occupational status and position of the head of household, the physical living conditions, and the educational level and language of the mother (the national languages are Spanish and Guaraní). The results reflect a higher death rate in the less developed regions.

Among the leading causes of death in children under 1 year old are infections, diseases preventable by vaccination, as well as those related to nutritional deficiencies. This structure of causes confirms the enormous potential for reducing infant mortality if the circumstances that foster these pathologies can be overcome.

There were changes in the order of causes of infant mortality from 1960–1969 to 1980–1984: diarrheal diseases moved from second to first place; pneumonia and influenza moved from first to second; injuries due to delivery, which had been the eighth leading cause, dropped out of the list of the ten leading causes of death; immaturity moved from fourth to fifth place; whooping

cough, from fourth to sixth; and infections of newborns, from seventh to fourth.

In 1987, the neonatal death rate was 18.2 per 1,000 live births, markedly lower than the rate registered in 1960, which was 45.8 per 1,000 live births. The structure of causes of death in this group is made up of those related to inadequate care in pregnancy and delivery and of infections, such as neonatal tetanus, which is the fourth leading cause.

Postneonatal mortality constituted the greatest component of infant mortality, accounting for almost 57% of the total in 1986. This mortality, mainly due to environmental factors, presents significant differences by geographical area.

The death rate in the age group 1 to 4 years old declined from 3.6 per 1,000 population in 1980 to 2.6 per 1,000 population in 1987. The profile of causes of death in this group indicates that diseases preventable by vaccination and diarrheal diseases are still the most important. In the last 20 years, the profile of causes of infant mortality, neonatal mortality, and mortality in the 1–4-year-old age group has included pathologies that can be easily reduced with vaccination, with improvements in environmental conditions, and with improvements in health care for pregnant women, deliveries, and newborns.

The leading causes of death in the 5–14-year-old age group were similar for 1964–1969 and for 1980–1984, with some variations in the order of importance. The cause group accidents and violent acts, which occupied second place, moved to first; diarrheal diseases dropped from first to second place; pneumonia, from third to fourth; measles, from seventh to sixth; and tetanus, from ninth to seventh place. The Ministry of Public Health has a national family welfare program that includes monitoring of all stages of the reproductive process and of child growth and development.

In 1975, poliomyelitis had a rate of 13 cases per 100,000 population. Since 1986, there have been no confirmed cases. Whooping cough, with 98.2 cases per 100,000 population in 1970–1974, declined to 13.7 in 1983–1987; measles decreased from 140.1 per 100,000 to 46.5; diphtheria, from 4.5 per 100,000 to 0.7; tetanus, from 13.9 per 100,000 to 6.8; and tuberculosis, from 119.7 per 100,000 to 61.7, all for the same periods.

As a cause of overall mortality, diarrheal diseases fell from third place in 1981 to fifth in 1985; the rate decreased from 51.1 deaths per 100,000 population in 1981 to 32.1 per 100,000 in 1985. These diseases represent the main health problem in children ages 0 to 4 years old, especially in nursing infants (with a rate of 11 per 1,000 in 1981 and 6.5 per 1,000 in 1984). The growing acceptance and use of oral rehydration salts and their free nationwide dissemination have facilitated early treatment of the disease and have contributed significantly to reducing the number of deaths from this cause.

Acute respiratory infections constitute the third leading cause of infant mortality (after diarrhea and injuries due to delivery and postnatal asphyxia), with a rate of 6 per 1,000 live births in 1981–1985. In children 1 to 4 years old, pneumonia and bronchopneumonia constitute the second leading cause of death after diarrheal diseases, with a rate of 49.9 per 100,000 in 1985. A national program to control acute respiratory infections has been implemented in an attempt to reduce the number of deaths from this cause.

Health of Adolescents and Adults

From 1982 to 1984, in the 15–24-year-old age group and for both sexes taken together, the leading causes of death were accidents (28.5%), suicides and homicides (12.8%), and complications of pregnancy, delivery, and the puerperium (11.3%). In that period, violent deaths accounted for 58.4% of deaths in men, and only 16.5% in women. The leading groups of causes in men were accidents (40.0%), homicides and suicides (18.4%), neoplasms (6.3%), diseases of the circulatory system (5.1%), and diseases preventable by vaccination and acute respiratory infections (5.1%). In women, the leading cause of death was complications of pregnancy, delivery, and the puerperium (27.8%), followed by accidents (11.9%), neoplasms (10.8%), diseases of the circulatory system (9.7%), and homicides and suicides (4.6%). Percentages are based on total deaths from defined causes.

Given the extent of its impact on family welfare, the potential for significantly reducing it with available technology, and the high priority placed on mothers, maternal mortality is considered particularly important. The 1986 maternal death rate of 2.7 per 1,000 live births, was the same as that observed in 1960, but significantly lower than the rates for 1968 and 1976, which were 6.0 and 6.3 per 1,000 live births, respectively. These were the highest figures during 1960–1986, a period during which this rate varied greatly.

The ranking of maternal death causes changed somewhat from 1962–1969 to 1980–1984. For example, the cause group “other complications of pregnancy, delivery, and the puerperium” shifted from second to first place; abortion moved from fourth to third place; and other complications and sepsis of delivery and the puerperium, which had ranked fifth, no longer featured among the causes of death.

For both sexes in the population aged 25 to 44 years old, accidents remained as the leading cause of death (16.5% in 1982–1984), followed by diseases of the circulatory system (15.7%); neoplasms (12.8%); complications of pregnancy, delivery, and the puerperium (11.0%); and suicide and homicide (10.8%). In men, the most frequent causes are accidents (25.2%), homicides and suicides (15.8%), and diseases of the circulatory sys-

tem (15.4%). In women, complications of pregnancy, delivery, and the puerperium (23.9%) still was the leading cause, followed by neoplasms (20.2%) and diseases of the circulatory system (16.0%), as the second and third leading causes, respectively.

In the same period, for the age group 45 to 64 years old diseases of the circulatory system (37.9%), neoplasms (19.9%), and acute respiratory infections (6.4%) were the three leading causes of death. These causes were followed by accidents (5.5%), diabetes mellitus (4.5%), and hypertensive disease (2.8%). If mortality is analyzed by sex, the significance of violent causes increases, with 12.3% of deaths from defined causes in men due to accidents, homicides, and suicides, while only 3.9% of deaths in women resulted from these causes. Neoplasms caused 13.8% of the deaths in men and 27.7% of deaths in women. Diabetes is the third leading cause in women (6.4%), while in men it is not among the six leading causes.

In the age group 65 years and older, 49.9% of all deaths are due to diseases of the circulatory system, followed by neoplasms (11.3%).

Problems Affecting the General Population

The incidence and prevalence of and the mortality from malaria, Chagas' disease, dengue, and leishmaniasis remain as serious public health problems. In rural areas, these diseases affect agricultural production and economic and social development. No autochthonous case of schistosomiasis has been detected in the country. In an effort to control these diseases, the National Service of Malaria Eradication (SENEPA) carries out a program that focuses on geographical areas with high incidence and prevalence.

The main nutritional problems are protein-calorie malnutrition, anemia, endemic goiter, and vitamin A deficiency. The Ministry of Public Health's efforts to address these problems include measures such as the administration of iodine in oil solution, salt iodization, and the promotion of a sound diet.

In 1986, 862 cases of syphilis were notified, with a rate of 37.9 per 100,000 population, and 428 cases of gonorrhea, with a rate of 18.8 cases per 100,000. In September 1986, the first AIDS case was diagnosed; the patient had been treated with factor VIII outside the country. From then until May 1988 seven cases were diagnosed; all of those patients have died.

A national campaign against AIDS is being implemented with the support of external agencies; it aims at strengthening the national infrastructure for HIV detection and at upgrading the national network of blood banks.

Regarding tuberculosis, some 8,000 bacilliferous cases were detected in 1987, with a prevalence of 0.52 per 1,000. That year, 1,000 cases were registered, with an incidence of 45 cases per 100,000 population. A national tuberculosis campaign provides diagnostic services and free treatment through the national network of health establishments.

In 1988, 379 cases of leprosy were registered, bringing the total of registered patients to 3,252 by the end of 1988. The Ministry's control program allows for the timely detection and treatment of cases, as well as high percentages of cured cases.

Available information shows that 21% of secondary school students had used drugs within the two months prior to being interviewed; in the capital the percentage was 25% and in the interior, 18%.

For the last few years, accidents ranked sixth as a leading cause of death, with rates ranging from 28 to 30.1 per 100,000 population. Of total accidents, 63% were motor vehicle traffic accidents; 31%, accidental falls; 3%, violent acts; and 3%, burns. In children, the breakdown of deaths due to accidents from those same causes is 20%, 62%, 12%, and 6%, respectively. There are no specific programs for accident control.

Urban rabies continues to constitute a public health problem, and there is agreement that this disease should be eliminated from the national territory. In 1988, some 4,000 people were bitten by animals suspected of having rabies, and 2,700 received treatment. Three people died as a result of this disease. Nationwide, 132,457 dogs were vaccinated. In the city of Asunción, coverage reached 65.7%; similar or lower coverage levels were obtained in other major cities.

In order to achieve the goal of eradicating urban rabies, a program was formulated and an agreement was signed with Brazil to ensure the supply of biologicals.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Systems

According to health code provisions, the health sector is constituted by all public and private institutions that conduct activities directly or indirectly related to the population's health. The sector's main institutions are: the Ministry of Public Health and Social Welfare, which is responsible for serving 60%–65% of the total population; the Social Security Institute, which covers 14% of the population; and the Armed Forces Health Service, which serves approximately 10% of the population. The

rest of the population is theoretically covered by the private subsector and other smaller public sector institutions.

In recent years, the private subsector has grown significantly. It is estimated that in 1986, its participation in the health service delivery system included 17.6% of hospital beds, 59% of consultations, 30% of hospital discharges, and 27.4% of institutional deliveries.

Regarding environmental health services, the Sanitary Works Corporation is responsible for water supply and for sanitary systems for excreta disposal and rainwater drainage in population centers with more than 4,000 inhabitants. The National Environmental Sanitation Service, which comes under the Ministry of Public Health, is responsible for providing the same services to localities with fewer than 4,000 inhabitants.

The Ministry provides leadership and direction in the sector, including defining the major national policies and approving and controlling public and private health plans, programs, and activities. It also coordinates the sector's institutions. Intrasectoral and intersectoral relations and coordination are still in their beginning stages and are developing slowly. There are no functional mechanisms for regulating the private subsector.

There are two basic models of care. The Ministry follows a comprehensive model that incorporates medical care and basic activities to promote and protect individual health, as well as activities for environmental control. Other institutions pursue an almost exclusively curative model.

National policies and priorities relating to the health infrastructure aim at improving and expanding the health services coverage, especially in rural areas; at improving the population's access to services (currently it is estimated that approximately 30% of the population has no access); at improving existing health services, especially at the primary and intermediate levels; at increasing the productivity and use of the physical, human, and financial resources; and at improving the quality of care through training, standardization, supervision, and control. The social security policy is oriented to expanding coverage by incorporating groups that can pay but which currently are not covered. In recent years coverage levels have remained unchanged.

There is no process for decentralizing the public administration or the health sector. The Ministry has established a regionalized system of services and has delegated some operational decisions to the regional chiefs, but this is not considered decentralization.

Production of Services

In 1987, there were 156,796 discharges from health services with beds for acute diseases; care for deliveries accounted for 42.7% of these. Of total discharges, 35.0%

were from Ministry of Health services, 27.4% from private hospitals, and 18.6% from the Social Security Institute; the National University and the Catholic University jointly accounted for 12.4% of all discharges, and the Military Health Service and the Police Health Service together, for 6.6%.

Nationwide, bed occupancy was 53.8% in 1987 and 48.1% in 1984. This ratio varies from institution to institution: the services of the two universities together had 92.7% occupancy; the private sector, 84.5%; the Ministry, 50.8%; the Social Security Institute, 41.9%; and the Military and Police Health Services together, 33.8%. Similarly, the average length of stay at the national level was 5.6 days, ranging from 10.7 days for services at the universities to 2.6 days for the private sector (Table 1). The national average has remained the same as in 1983, although it fluctuated slightly in previous years.

Available information on outpatient care does not cover the institutions or all the activities carried out. In 1987, there were 3,027,420 consultations (as compared to 1,958,549 in 1984), excluding those in private establishments. Of that total, 48.0% corresponded to the Social Security Institute, 45.8% to the Ministry, 4.6% to the universities, and 1.7% to the Military and Police Health Services. Only the Ministry and the Institute keep separate records for consultations of children and pregnant women; for both groups, the Ministry served the larger share. Immunization coverage in children under 1 year of age increased from 1983 to 1987 as follows: BCG, from 60.2% to 65.7%; DPT, from 43.2% to 58.0%; polio vaccine, from 46.0% to 99.2%; and measles vaccine, from 24.8% to 56.2%.

The Ministry of Public Health's national program for poliomyelitis vaccination and eradication has received major technical and financial support from international cooperation agencies, as well as the broad participation of the other sectors and of the community; this has led to a vaccination coverage greater than 90% in children under 4 years old.

Installed Capacity

In 1987, the country had 631 health establishments with 5,437 beds for a population estimated at 3.9 million, or 1 establishment per 6,180 population and 1.4 beds per 1,000 population. This latter ratio will increase to approximately 1.9 beds per 1,000 population in 1989, once the 1,407 new beds built in 1987 and 1988 are used (240 in Social Security institutions and 1,167 in Ministry of Health institutions). Of the existing beds in 1987, 34.5% belonged to the Ministry of Public Health and 21.3% to the Social Security Institute.

Of the total establishments, 413 (65.5%) belong to the Ministry, 110 (17.4%) to the Social Security Insti-

| Description | Country total | Ministry of Public Health | Social Security Institute | Military/ Police Health | National University/ Catholic University | Private |
|--|---------------|---------------------------|---------------------------|-------------------------|--|---------|
| Total beds for acute diseases | 4,440 | 1,448 | 1,160 | 853 | 617 | 362 |
| Total discharges for acute diseases | 156,796 | 54,866 | 29,097 | 10,404 | 19,506 | 42,923 |
| Total institutional deliveries | 67,215 | 29,978 | 10,485 | 6,720 | 3,831 | 16,201 |
| Institutional deliveries as a percentage of total discharges | 42.7 | 54.6 | 36.0 | 64.6 | 19.6 | 37.7 |
| Percentage occupation | 53.8 | 50.8 | 41.9 | 33.8 | 92.7 | 84.5 |
| Average length of stay (days) | 5.6 | 4.9 | 6.1 | 10.1 | 10.7 | 2.6 |
| Bed turnover | 35.3 | 37.9 | 25.1 | 12.2 | 31.6 | 118.6 |

Source: Ministry of Public Health and Social Welfare, Department of Biostatistics.

tute, 79 (12.5%) to the Armed Forces Health Service, 2 (0.3%) to the Police Health Service, 2 (0.3%) to the National University of Asunción, 2 (0.3%) to the Catholic University, and 23 (3.6%) to the private sector. The network is comprised of the following types of establishments: 387 health posts (61.3% of the total) with 125 beds (2.3% of the total) that cannot be considered hospital beds; 5 peripheral clinics (0.8%) without beds; 154 health centers (24.4%) with 836 beds (15.4%); 33 Social Security Institute health units (5.2%) with 666 beds (12.2%); 11 regional health centers (1.7%) with 370 beds (6.8%); and 41 hospitals (6.6%) with 3,440 beds (63.3%).

Of all beds, 997 (18.3%) are in establishments devoted to the treatment of chronic diseases: 339 for tuberculosis, 486 for psychiatric disorders, 100 for leprosy, and 72 for cancer. Broken down by institutions, 427 beds (42.8% of the beds for chronic patients) correspond to the Ministry of Health, 530 (53.2%) to the National University, and 40 (4.0%) to private nonprofit agencies.

Of the total acute-care beds 2,473 (55.7%) are in the capital area and 1,967 (44.3%) in population centers in the interior. Of the beds in the interior, 725 (36.9%) belong to the Social Security Institute, 654 (33.2%) to the Ministry, 477 (24.2%) to the Military Health Service; 81 (4.1%) to the private sector; and 30 (1.6%) to the Catholic University.

There is considerable duplication of health care installations in the interior, particularly regarding establishments with beds. All Social Security Institute health units

are located in towns or cities where the Ministry also has health centers, and the same is true for Military Health Service installations. The Ministry's service units are distributed in all the country's geographical subdivisions; their beds range from 0.4 to 1.3 per 1,000 population. Although each institution's area of geographical responsibility has not been precisely defined, the Ministry estimates that it must cover 82.0% of the total population (this percentage varies from a minimum of 53.7% for the Asunción area to a maximum of 99.4% in the Department of Guairá). In addition, the Ministry estimates that it provides effective care to an average of 15.5% of the population it must cover nationally, with this figure varying among departments.

The services network does not function well due to many problems such as a lack of adequate local planning and programming of resources and activities; insufficient resources for promotional and preventive activities; an uneven geographical distribution of human resources and inadequate professional and technical personnel training due to a lack of coordination between the employing and the training institutions; a shortage of specialized personnel of all types and unfavorable employment conditions; insufficient availability of drugs, medical and surgical supplies, biomedical equipment, and other critical supplies; shortcomings of coverage, breadth, and timeliness in the information system, both in terms of determining care needs and in administration and management; insufficient maintenance of the buildings, installations, and equipment; and weak horizontal op-

erational coordination among the services that leads to duplication of efforts and waste.

Health Services Technologies

Overall, sectoral and institutional health technology is insufficiently developed. No national technology policy has been defined in the health sector, and the Ministry does not have a specific office to coordinate this area. The country increasingly relies on foreign technologies, especially from the United States of America, Japan, Federal Republic of Germany, Brazil, and Argentina, whose influence has been partially curtailed by the recent economic crisis and by fluctuations in the national currency and the currencies of supplier countries. This situation has brought about the great variety of equipment used in the health services system and has caused serious operational and maintenance problems.

The national pharmaceutical industry, which is just beginning to be developed, mainly deals with dividing, packaging, and other final processing activities for imported raw materials. The industry aims at eventually reducing imports of the most consumed basic drugs or of substituting them for those whose preparation does not require complex technologies or large capital investments. The drug industry has some 45 privately owned production laboratories, one Social Security Institute laboratory, and one small laboratory that is part of the Military Health Service.

The country only produces biologicals for animal use; those for human use are imported. The Ministry does not have a well-developed quality control laboratory. The Central Laboratory and the Institute of Tropical Medicine carry out some basic analyses of drugs, biologicals, and food. The supply of drugs in the Ministry's services is inadequate, and the population's access to drugs varies according to a person's ability to pay, since there is no policy of free distribution, except in very special cases. The Ministry has a basic drug program that is not yet properly organized.

Regarding x-ray diagnosis, radiation therapy, and clinical, pathology, and public health laboratories, the situation is no different: available equipment is imported, and the most sophisticated equipment is concentrated in Asunción. No peripheral network is properly organized, and the existing network suffers from structural and procedural deficiencies, as well as from an inadequate supply of basic inputs for the provision of services.

The country's only blood bank comes under the Ministry; it is being improved so that it may take advantage of the most recent advances for hemotherapy and AIDS detection and control.

Financing of the Health Services

It is estimated that health expenditures in 1987 came to 58.78 billion guaranis, of which 60.7% corresponded to the private subsector and 39.3% to public institutions. Of the latter, those with the largest expenditures were the Ministry, with 18.9% of the total, the Social Security Institute, with 17.1%, and the university hospitals, with 2.0%. This distribution of public spending in health changed little from 1984 to 1987. According to available estimates, 88.8% of total health expenditures were for curative and rehabilitation activities, 4.6% for promotion and prevention, and 6.6% for administration. Only the Ministry allocates funds for health promotion and prevention activities; they account for 24.5% of its budget.

Of total expenditures in the public subsector, 76.3% are regular expenditures and 23.7%, capital expenditures. Of the former, expenditures on personnel (permanent and temporary staff, per diem, and travel expenses) account for 50.2% of total expenditures for the public subsector, ranging from 43.7% for the Social Security Institute to 58.1% for the Ministry. However, personnel services account for more than 90% of the Ministry's total regular expenditures. Expenditures for drugs, which for the public subsector represent 19.1% of total expenditures, come to 36.4% in the Institute, and barely 1.5% in the Ministry (Table 2).

The budgetary resources for health expenditures derive basically from payment for services (61.4% of total revenues); quota payments from employees, workers, and employers (22.3%); and contributions from the general budget (11.7%).

Health Planning and Administration

The national planning system's framework is guided by traditional concepts of normative planning. National planning is under the responsibility of the Technical Planning Secretariat of the Office of the Presidency, which establishes government policy guidelines and coordinates with the sectoral planning units to formulate the sectoral plans. The 1985–1989 National Economic and Social Development Plan recognizes that the country has structural and circumstantial problems that prevent reaching the national goals. Among these problems are a dual, primary productive structure with a large idle capacity; some scarcity of qualified human resources; incipient scientific and technological development; economic recession; reduction of external financial flows; adverse monetary and financial consequences from neighboring countries; and inflation and unemployment.

The Ministry is responsible for health sector planning,

| Object of expenditure | Total expenditure public subsector | Social Security Institute | Ministry of Public Health |
|--|------------------------------------|---------------------------|---------------------------|
| Total expenditures | 100.0 | 100.0 | 100.0 |
| Regular expenditures | 76.3 | 88.1 | 63.6 |
| Permanent staff | 44.0 | 43.4 | 45.5 |
| Temporary staff | 6.1 | 0.1 | 12.2 |
| Per diem and travel expenses | 0.1 | 0.2 | 0.4 |
| Drugs and medicinal products | 19.1 | 36.4 | 1.5 |
| Food | 2.7 | 3.4 | 2.0 |
| Other regular expenditures not specified elsewhere | 4.3 | 4.6 | 2.0 |
| Capital expenditures | 23.7 | 11.9 | 36.4 |
| Building construction | 9.5 | 4.9 | 14.2 |
| Aqueducts construction | 5.2 | — | 10.5 |
| Tools, equipment, and instruments | 6.9 | 3.0 | 10.9 |
| Maintenance and repair of equipment | 0.1 | ... | ... |
| Other equipment | 2.0 | 4.0 | 0.8 |

Source: General Budget of the Nation.

but in practice, each institution conducts its own planning. The Ministry's planning process is still weak: it formulates the macro-level plan and breaks down goals by health regions, but does not include any feasibility analysis or the implementation and formulation of operational plans.

The 1984–1988 national health plan places priority, as a matter of government policy, on curative and rehabilitation activities, and on the control and prevention of communicable and noncommunicable diseases through comprehensive personal health care and environmental health activities. The plan's overall objectives are to increase life expectancy at birth and improve the quality of life; to extend health services coverage and to address the environment; and to incorporate the population in health activities.

Since 1989, the Ministry, with PAHO/WHO support, has developed a process for local programming that makes it viable to establish local health systems and decentralization and that facilitates changing the current form of vertical planning to a participatory educational process.

Human Resources

According to the reports of the Human Resources Department of the Ministry of Health, in 1986 the Ministry's different organizational levels had a total of 3,624 employees: 15.5% were physicians (561); 4.9%, dentists (176); and 8.6%, obstetric nurses (311).

The census registered 11,278 health workers: 56.2% had university training, 14.4% had technical (mid-level) training, and 29.4% were auxiliary health workers. The ratio of health personnel to population was 34.6 per 10,000 population (in 1974 this figure was 30.4). The increase over an 11-year interval was 43.9%. In 1985, the ratio of health personnel in Asunción was 139.36 per 10,000 inhabitants, accounting for 60.6% of all such personnel nationwide. The ratio for the rest of the country was 16.0 per 10,000 population, accounting for 39.4% of the total. In 1985, 24.8% of the total population lived in Asunción and 75.2% lived in the rest of the country.

If current trends hold, by the year 2000 the ratios of

university-trained personnel, technical personnel, and auxiliary personnel will be 29.2, 3.6, and 8.3 per 10,000 population, respectively.

The distribution of professionals by institution indicates that the Ministry is the largest single employer of physicians, dentists, and obstetric nurses, with 34.1%, 20.6%, and 46.4%, respectively. The private sector employs 50.4% of all nurses; the Military Health Service, 16.9%; the Ministry, 13.6%; and the Social Security Institute, 8.5%.

The structure of the health team is imbalanced, since there are only 0.75 nurses with university-level training per 10,000 population, and barely 0.11 per physician. The university education of nurses and obstetric nurses is fragmented and does not lead to a well-rounded professional who can provide comprehensive care. There are also unsatisfactory levels per 10,000 population of nurses with technical training (0.83) and, to a lesser degree, of nurse auxiliaries (7.16). The latter accounted for 70.4% of all auxiliary health workers in the census.

The concentration of professionals in the capital generates unemployment, underemployment, and multiple employment. The census showed that 26.5% of all physicians have three or more workplaces, 34.5% have two, and 39.0% have a single workplace.

The insufficient number and categories of personnel and the unevenness of their geographical and institutional distribution largely stem from the lack of a health manpower policy in terms of both training and utilization, from the health care policy, and from the lack of intra-sectoral and intersectoral coordination.

In 1985, 27.0% of the physicians were women and 59.1% of all physicians were 25 to 39 years old.

Nationwide, there was a ratio of 2.8 dentists per 10,000 population; 80.9% worked in the capital, where the ratio was 15.2 per 10,000 inhabitants (it was 0.68 in the rural area). Of the total, 20.6% work with the Ministry, 14.2% with the university, 11.8% with the Social Security Institute, and 56.0% in the private sub-sector; 61.3% were women, and their average age was 43.2 years.

Nursing personnel accounted for 25.3% of total health manpower. Of these, 8.6% had university training (245); 9.6% had completed nursing secondary school (271); and 82.0% were nurse auxiliaries (2,333). Of the orderlies, 71.4% were between the ages of 25 and 39 years old, and 98% were women. The census registered 373 obstetricians with university training, 248 obstetricians with technical training, and 225 obstetric auxiliaries. Of the obstetricians, 60% worked in the capital and 31.4% were in the 25 to 29 year old age group.

The Ministry trains auxiliary health personnel through a six-month study program, and requires that they work as nurse auxiliaries. These personnel (3,316) account for

29.4% of total health manpower, with a ratio of 10.2 per 10,000 inhabitants; 37.2% work in the capital. Of all auxiliary personnel, 70.4% is constituted by nurse auxiliaries (2,333).

In the general national budget for fiscal year 1987, 68.4% of the outlays allocated to the Ministry were for general expenditures and 31.6% for capital expenditures.

HEALTH AND THE ENVIRONMENT

The main environmental problems are a lack of a better and more streamlined organization for conducting comprehensive actions, of clearly defined policies, of managerial capacity and human resources, and of information services and the failure to regulate the health code.

The current status of water services reflects an effort by the Ministry to meet the decade's goals regarding coverage, which for 1990 are: 69.5% for urban water supply, 12.3% for rural water supply, 34.2% for urban sanitary sewerage services, 62.3% for individual urban excreta disposal, and 80.2% for individual rural excreta disposal.

The population that had running water at the beginning of the decade came to almost 450,000 in the urban area and less than 162,000 in the countryside. Despite efforts and international loans for works, the covered population has increased but the coverage declined as a result of population growth. Thus, since 1980, the country's annual number of household connections exceeded 9,000, and currently there are fewer than 6,000 per year. As of late 1988, coverage was 49% of the urban population and only 6% of the rural population, which probably means that the projected goals will not be met unless a greater effort is undertaken. Water supply services with household connections in Asunción, the capital, cover 75%.

Regarding excreta disposal, the pace also has steadily declined due to the lack of priority attributed to these programs and to the fact that Paraguay is basically a rural country; the 60% of the population living in the interior uses individual systems that yield very low coverage at the national level. For example, beginning in 1982, more than 18,000 latrines were built annually; but in 1987, this figure reached only slightly more than 9,000.

Regarding the major problem of trash disposal, there have been few activities that have yielded positive results. But a recent survey on urban sanitation in the 35 most important municipalities will make it possible to improve the municipal infrastructure and to increase coverage to more than the 300,000 persons currently served in the interior. There are no sanitary landfills in the country, only open cut dumps.

Even though the country has food safety legislation,

conditions are deficient due to a lack of adequate equipment and quality laboratories, thus giving rise to a risk of food contamination and deterioration.

The health risks from environmental pollution require ongoing activities, such as ecological impact studies in dams and lakes. Joint actions are being carried out for

the control of schistosomiasis, malaria, leishmaniasis, and Chagas' disease through bilateral projects with Brazil. There are also serious pollution problems from alcohol factories, from the growing urbanization around some lakes, and from the waste of industrial plants that process sugars, meats, and hides.

PERU

GENERAL CONTEXT

Political, Economic, and Social Situation

The socioeconomic crisis that began in 1975 and worsened in 1983 and in 1988 has become Peru's deepest and longest. In 1985, the country adopted an economic policy that favored the needs of the poorest sectors by increasing their purchasing power, redistributing income, and expanding employment opportunities. At the same time, external debt payments (which in 1988 totaled \$US15.467 billion) were limited to 10% of export earnings in an effort to shift resources toward domestic growth. Public spending, which increased from 1985 to 1987, represented 28.6% of the gross domestic product (GDP) in 1985 and 29.2% in 1987, with deficits increasing from -0.6% to -5.5% of public revenues.

From 1985 to 1986, after a decade in which purchasing power declined an estimated 24%, wage-earners finally experienced an increase in real income. Although employment conditions improved from 1985 to 1987, they deteriorated significantly in 1988. Unemployment, which had declined from 11.8% in 1985 to 7.3% in 1987, increased once again to 13.0% of the economically active population (EAP) in 1988. The urban informal sector employed 23% of the urban EAP in 1986 and 40% in 1988, manifesting a process of self-generated employment that proved to be an effective strategy for popular survival. The share of EAP employed in the tertiary sector of the economy—which accounts for most of the informal sector—increased from 42% in 1981 to 48% in 1987. In the same period, the EAP employed in the primary sector fell from 42% to 38% and declined from 16% to 14% in the secondary sector.

The average annual increase in consumer prices, which went from 159% in 1985 to 63% in 1986, rose to 115% in 1987 and to 1,723% in 1988. In mid-1987 an accelerated inflationary process was triggered, followed by a severe economic recession. In the context of these economic circumstances, the Government progressively reduced subsidies for basic food items and public services, and the currency experienced a major devaluation. It was estimated that by late 1988 total GDP had declined at a rate of -9.6% and that per capita GDP was decreasing

at a rate of -11.9% (the GDP had risen 8.6% in 1986 and 6.9% in 1987, and per capita GDP had increased 6% in 1986 and 3.9% in 1987).

In mid-1987, the drastic inflation brought about a reduction in vital minimum real income and canceled gains in the redistribution of national income. By December 1988, vital minimum income had declined 48% relative to the December 1987 level. Wage-earners' share of income held steady at 34% in 1987 but fell to 21% in 1988. In contrast, profits accounted for a larger share of income, increasing to 40% in 1987 and 50% in 1988.

The results of the National Household Survey on Standard of Living Measurements (ENNIV 1985-1986), which compared 1981 employment and income indicators with those for 1985-1986, indicate significant increases in the overall economic activity of the national population aged 6 years and older (37.9% to 46.5%) and in the participation of women (25.1% to 38.5%) and children aged 6 to 14 (2.1% to 5.7%). In addition, the results show an increase in the EAP of persons aged 15 and over in the category of nonremunerated family worker (5.2% to 16.3%) and in commerce (13.3% to 20.7%).

Average food consumption increased from 298 kg per capita in 1985 to 315 kg in 1987. Daily per capita caloric intake increased from 1,780 to 1,810 calories, and daily per capita protein intake from 41.6 g to 46.0 g. Starting in March 1988 the availability and consumption of basic foods declined, and this situation further deteriorated in September 1988 as part of the new pricing policy's social cost.

By 1989, the available food supply decreased some 450,000 tons because the cultivated area decreased as a result of less available agricultural credit, a reduced supply of fertilizers subsidized by the State, and the serious instability that prevailed in various regions, especially those buffeted by terrorism and drug trafficking. In the short term, this situation will cut back food availability and it will have serious repercussions on the health and nutrition of those living in poverty—34% of the national population.

The average years of completed schooling increased from 3.7 in 1972 to 5.1 in 1986, with a trend toward higher levels of education among males (5.6 years) than females (4.7 years). From 1972 to 1985-1986, the pop-

ulation aged 15 and over with no education declined from 26.2% to 14.8%; the population with secondary education rose from 20.4% to 36.3%; and the percentage with university education increased from 4.5% to 11.7%. The illiteracy rate in the population aged 15 and over is 16.6%.

Of all dwellings, 38.5% have complete electricity, drinking water, and public sewerage services; 38.5% have incomplete services; and 23.0% have no services whatsoever. Of private residences, 72.6% are owner-occupied and 15.7% are rented.

In response to the (August 1985) Economic Emergency Plan's decision to limit debt service payments to 10% of the country's total export earnings, the international financial organizations are no longer granting new loans and have suspended disbursement of loans already agreed upon. International banks have classified Peruvian debts as "depreciated value" and have declared the country ineligible for additional financing.

The Government's strategy showed positive results during the first two years, especially in the fight against inflation and economic recession. Because of this success, the constitutional regimen was considered the appropriate framework for solving the country's problems. The Economic Emergency Plan called for an increase in real wages, price controls on basic goods, reduced interest rates, concentration of credit for priority sectors, deconcentration of public investments, promotion of regional development, and support for the rural areas of the Andean Trapezium, particularly those areas where Shining Path guerrillas are most active. The exchange rate was stabilized, and the State increased its participation in the economy. An effort was made to redefine relations with foreign investors, and cement and food industry monopolies were restricted. Deposits and bank certificates in foreign currency were frozen. A partial control of exchange rates was established with differential rates for foreign trade, and imports of nonessential items were cut back.

The proposal to nationalize the banking system met with significant opposition. Since then, opposition to the Government's economic and labor policies by political parties and labor movements has intensified. The failure of the economic policy and the erosion of the Government's political support bases led to a return to early 1985 levels of social and political polarization. One of these extremes corresponds to the subversive groups Shining Path and Túpac Amaru Revolutionary Movement; the other, to extreme right-wing groups which reject the possibility of success under a constitutional regime and advocate antidemocratic solutions.

The 1986–1990 National Development Plan, approved in December 1986, has the following specific objectives: meeting the basic needs of the entire population,

reducing the marginalization of the Andean and native population and reassessing their sociopolitical and cultural status, and increasing social peace and the country's identity, participation, and solidarity.

Both the Economic Emergency Plan and the 1986–1990 National Development Plan attempted to establish a series of stages that would progressively solve inflation and recession within the context of coordination among all sectors. The first stage contemplated a reactivation of the economy by expanding internal demand (1986); the second sought substantial and selective investment (1987); the third aimed at generating and saving foreign exchange (1988); and the fourth would consolidate the restructuring of production and consumption (1989–1990). By the first half of 1987, signs pointed to the failure of the economic model, and it became evident that the economic surplus generated in the previous two years had not been reinvested in the country.

Given the country's deteriorating economic and social situation, in February 1989 the Government presented the document "Foundation for an Economic Pact of National Solidarity" for discussion with business and labor. According to the proposed pact, the State would set and maintain the legal minimum income level based on inflation and would protect the purchasing power of the poorest sectors through direct subsidies and through the Social Compensation Program, which has an initial budget of almost 20 billion intis for food and medical supplies for breast-feeding mothers, children under 6, and other population groups at greatest risk.

Violence, drug trafficking, and subversive activities are serious and complex problems. Their political, social, and economic costs, which have accumulated in the course of the 1980s, severely restrict development and well-being, and, thus, the population's health. The areas most affected by subversive activities are the departments of Ayacucho, Lima, Huancavelica, and Junín, and, to a lesser degree, Pasco, La Libertad, Huánuco, San Martín, and Apurímac. According to the Senate Commission on Violence and Pacification, democracy has been undermined in the areas under a state of emergency—33% of the national territory, representing 36% of the country's districts and 40% of the national population—and there is increased risk that the civilian population's basic rights may be violated.

Health personnel have been particularly affected: health authorities have been threatened and pressured by subversive forces, and those who work in the areas under a state of emergency are caught between pressures to collaborate with the subversive movement and to work against it. In these emergency areas, health workers have abandoned peripheral establishments located in unprotected areas and have taken refuge in urban hospitals; many of these facilities have suspended programs and field

activities. Subversive groups also hinder the work of non-governmental organizations that promote community development and health care in rural areas.

Since its beginning, violence from terrorism has resulted in an estimated 12,000 deaths: of these, 54.7% have been subversives; 38.7%, civilians; and 6.6%, members of law and order forces. Terrorism's estimated economic cost from 1980 to 1988 is about \$US10 billion; the average annual cost has been approximately \$US1.02 billion, or nearly 18% of the country's annual investment.

Demographic Characteristics

From 1940 to 1988 the country underwent a demographic upheaval that radically changed the population's size and geographical distribution and significantly modified the extent and structure of demand, consumption patterns, and the availability of resources for meeting basic needs. At the onset of this period, the country's population of 10 million inhabitants was predominantly Andean, upland, rural, and agricultural; by the end, Peru's population had reached 21 million inhabitants living mostly along the coast and in the cities, and the country's economy had a large informal sector.

The National Institute of Statistics estimates that by the year 2000, the country will have almost 28 million inhabitants, and by 2025, 41 million. In 1988, the crude death rate was 9.03 per 1,000 population, and life expectancy at birth, 62 years. General fertility was estimated at 4.4 children per woman, and the crude birth rate at 34.2 births per 1,000 population.

In 1988, the Lima metropolitan area, with six million inhabitants, ranked as Latin America's fifth most populated urban area, and represented 28.5% of the national population, 42% of the total urban population, and 55% of the coastal region population.

Migration from rural to urban areas led to the development of human settlements called "young towns"; these settlements rapidly multiplied and grew in the outskirts of large cities, surrounding them with belts of misery. In the mid-1980s, more than 50% of the total population in some of Peru's larger cities lived in these areas.

The proportion of the population under 15 years of age will decrease to 35.6% by the year 2000, and to 25.2% by 2025. However, that age group will increase in absolute numbers from 8 million in 1988 to approximately 10 million by the year 2000, and to 10.3 million by 2025. The percentage of the population aged 15 to 64—the economically active population—will increase from 56.7% in 1988 to 60% by the year 2000, and to 67% by 2025. In addition, the number of persons over 65, which at approximately 850,000 accounted for 3.9% of the population in 1988, could reach 1.2 million by

the year 2000 and 3.1 million (7.6% of the total population) by 2025.

According to the 1985–1986 ENNIV, the population with very high income represented 2.0% of the total population and earned 19.0% of total income, while the very low income population represented 60.3% of the total population and earned 23.8% of total income. The very low income group corresponded to 46% of the urban population, 83% of the rural population, and 79% of the population living in the highlands. The very high income group represented 3.5% of metropolitan Lima's population and less than 1% of the population living in the highlands.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

Vital statistics information, based on data from civil registers, suffers from much underregistration and defective processing. In the last decade, underregistration of mortality reached approximately 50%, and although it significantly affected the rates and percentages, it did not change the rank of the leading causes of death. Two out of every three registered deaths are medically certified, which puts the quality of diagnosis at an "intermediate" level in the context of Latin American countries.

The data on mortality levels used here are the National Institute of Statistics' and the Ministry of Health's official data. Data prepared by the Analysis Unit of the Ministry of Health's General Bureau of Statistics, based on the death certificates registered in 1985, have been used to determine the leading causes of death.

Five broad groups of causes of death accounted for 54.5% of the deaths registered in 1985: diseases of the respiratory tract (17.1%), diseases of the circulatory system (14.1%), neoplasms (9.5%), perinatal causes (7.1%), and accidents and violence (6.7%).

There are major inequities in the country's population, particularly regarding standard of living and mortality. The greatest risks of death are found in the departments with the highest proportions of rural population and the least relative development, which are located mainly in the highlands (Huancavelica and Cuzco); the lowest mortality levels are in the departments with the greatest proportion of urban population and the highest standards of living, mostly in the coastal region. The mortality rates in Huancavelica are the highest in the country: the crude death rate is 18.0 per 1,000, life expectancy at birth is 47.6 years, mortality in children under 5 years is 54%, and 34.9% of the deaths are due to respiratory infections

and diseases of the digestive system. In contrast, the crude death rate for El Callao is about one-third as high, life expectancy at birth is 20 years greater, and 34% of the deaths are due to degenerative diseases.

Health Situation of Specific Population Groups

The 1984 National Nutrition and Health Survey (ENNSA-1984) shows that 35.3% of the population had had some symptom of disease, an accident, or both, in the two weeks before the interview. The proportion reporting symptoms varied with age group: it was highest in children under age 6 (60%) and lowest in 15–24-year-olds (18.6%). More women (37.7%) reported symptoms than men (35.4%). There were no significant differences between urban (34.6%) and rural (36.4%) areas, or between one geographical area and another, except in the coastal region and the southern highlands, where the lowest level in the country (26%) was reported.

The incidence of diseases preventable by vaccination continued to decline, and by 1987, these diseases accounted for just 0.9% of all diseases reported. The rates per 100,000 population registered in 1980 and 1987, respectively, were as follows: measles, 111.3 and 30.1; whooping cough, 70.2 and 11.3; tetanus, 3.04 and 0.20; poliomyelitis, 1.10 and 0.02; and diphtheria, 1.07 and 0.02.

Child Health

The National Institute of Statistics estimated the population of children under 5 years old to be approximately 3 million (15% of the total population) as of mid-1987. By the year 2000, this population is expected to amount to almost 3.5 million, and its proportion within the total population is predicted to drop to 12.3%. In 1987 the same Institute estimated some 88,433 deaths in children under 5, which represented an infant mortality rate of 88.2 per 1,000 live births and a death rate of 10 per 1,000 children aged 1 to 4. Expected mortality levels for the year 2000 are 62.0 and 7.1, respectively.

ENNSA-1984 showed a high prevalence (38%) of chronic malnutrition (low height-for-age) among children under age 6; this rate was greater in rural (56.4%) than in urban areas (23.4%) and varied by geographical location (from a high of 62.6% in highland rural areas to a low of 15.0% in the Lima metropolitan area).

Results from this same survey indicated that almost two-thirds of the children under age 5 had had symptoms linked to acute respiratory infections (40.6%) or diarrheal diseases (23.8%) during the two weeks prior to the interview. These data, which point to a high incidence of

diarrheal diseases in children, were confirmed by the results of the National Health Survey conducted in 1986 (ENDES-1986), which showed that almost one-third of the affected children under age 5 (31.9%) had had diarrhea during the two weeks prior to the interview. In 1987, cases of acute respiratory infections and diarrheal diseases accounted for 57.9% and 37.8%, respectively, of all cases of reported diseases in children under 1 year, and 51.9% and 30.8% of all reported cases in the 1–4-year age group.

ENDES-1986 results reflect significant differences in mortality due to socioeconomic factors among children under age 5. The death rate in children under age 1 in rural areas (101.0) is almost twice the figure registered for urban areas (54.0). If the figures are broken down by natural regions of residence, this gap increases: infant mortality in the highlands (110.0) is three times the rate calculated for Lima's metropolitan area (34.0). The greatest differences deal with the mother's educational level: infant mortality among children of women with no schooling is 5.6 times greater than the expected rate in children of women with higher education, or 124.0 and 22.0, respectively.

The National Institute of Statistics estimated a population of 5.2 million children aged 5–14 in mid-1987 (one-fourth the overall population); this age group will reach 6.5 million by the year 2000 (23.3% of the country's population). Poverty is forcing more children aged 5 to 14 to work, almost always in exploitative conditions. The rate of economic activity for this age group has tripled in five years, going from 2.1% in 1981 to 5.7% in 1984. Currently, some 628,000 schoolchildren are at risk of serious malnutrition, while 325,000 remain at high social risk.

In 1987, the three disease categories reported most frequently for this group were acute respiratory infections (53.0%), diarrheal diseases (17.1%), and helminthiasis (15.2%). In 1985, the mortality rate for this group was 1.8 deaths per 1,000 children aged 5 to 14. The percentage of deaths in the same group relative to total deaths in the country was 4.1%.

Health of Adolescents and Adults

In mid-1987, 11.7 million inhabitants (56.6% of the total population) were within the 15–64-year age range; it is expected that by the year 2000 this figure will increase to 16.8 million (60% of the total population). As with school-age children, respiratory infections, digestive diseases, and helminthiasis were the three causes of illness reported most frequently for this age group. Ranking fourth and fifth were malaria, with a specific rate of 2.16 per 1,000, and tuberculosis, with a specific rate of 1.62 per 1,000. This age group accounts for 97% of syphilis

cases, 93% of gonococcal diseases, 84% of leprosy cases, and 80% of reported tuberculosis cases.

In 1985, the death rate for the adult population was estimated at 4.31 deaths per 1,000, and showed the following subgroup differences: 2.1 per 1,000 for the 15–24-year age group; 3.2 for the 25–44-year age group; and 10.6 for the 45–64-year age group. The population aged 15–24 has had their adolescence and youth affected by both the economic and social crisis and the political violence by armed groups. In attempting to cope with these unfavorable conditions, many young people have engaged in risky behaviors that are manifested in the high frequency of accidents, alcohol and drug abuse, and early and unwanted pregnancies. Young people aged 15–24 account for 50% of all persons arrested for common crimes, 56% of reported cases of drug addiction, and 44% of users of cocaine free base. In addition, a 1987 national survey showed that 8% of the 12–18-year age group habitually consumes alcohol, 24% consumes stimulants, and 10% consumes marijuana.

In the 15–44-year group, the leading causes of mortality were accidents and violent acts (21.7%), tuberculosis (13.3%), neoplasms (10.1%), and diseases of the circulatory system (8.1% of all deaths). These four groups of causes were responsible for 10.3%, 2.7%, 1.9%, and 1.3% of hospital discharges, respectively.

It is estimated that in 1987 there were 20,373 deaths in women aged 15–44, of which 2,241 were due to direct obstetric causes. This indicates a ratio of 11 obstetric deaths for every 100 deaths in women aged 15–44, as well as a high maternal death rate (31 per 10,000 live births). The percentage distribution of causes of obstetric deaths registered in 1983 shows that the most common cause is hemorrhage of pregnancy and childbirth (33.0% of the total) followed by, in order of frequency, complications of the puerperium (14.4%), abortion (11.1%), and toxemia of pregnancy (8.3%). Indirect obstetric causes were responsible for 0.7% of the maternal deaths registered.

A study carried out in 1983 among Ministry of Health establishments (where poor mothers receive health care) confirmed a high in-hospital maternal death rate (16.8 obstetric deaths per 10,000 live births), four times the registered rate for hospitals in the social security system. The main causes of in-hospital maternal deaths were puerperal sepsis (26%), hemorrhage (21%), abortion (20%), and toxemia (17%). Indirect obstetric deaths accounted for 11% of the total.

Mine workers face very serious health risks. In studies of 45,000 miners the prevalence of silicosis was 7.8% (one out of every 12 workers examined) after fewer than five years of exposure. In the mining and metallurgical industry the rates of prevalence were 44% for mercury poisoning, 37% for arsenic poisoning, and 16% for lead

poisoning. Approximately 26% of the drill runners and their assistants suffer from or have a propensity for occupational deafness and 17% are affected by acoustic trauma.

Health of the Elderly

A rise in life expectancy has led to increases in the elderly population and in the proportion of women in this age group. In 1987, nearly 750,000 inhabitants were 65 and over (3.6% of the overall population), with a ratio of 83 men for every 100 women. According to National Institute of Statistics estimates, by the year 2000 the elderly will reach 1.2 million, and by 2025, 3.1 million (7.6% of the total population).

In 1985 the specific death rate was estimated at 77.1 deaths for every 1,000 persons 65 and over, with variations by department from a high of 90.4 per 1,000 in Huancavelica to a low of 69.1 per 1,000 in El Callao. The four most frequent causes of death were diseases of the circulatory system (30.1%), diseases of the respiratory system (14.9%), neoplasms (14.1%), and other digestive diseases (6.7%).

Problems Affecting the General Population

Tuberculosis is one of the main morbidity causes. In 1987, 23,750 new cases of tuberculosis were registered (114.6 per 100,000), 93% of which were of the respiratory form. The rate of infection is estimated at 2%, and mortality at 21 per 100,000 population. The most vulnerable and affected groups are young adults and residents of areas where major migratory shifts occur.

Seventy-four percent of the national territory has ecological conditions favorable for malaria transmission. In the exposed population, estimated at 6.8 million inhabitants in 1987, there were 39,893 cases (192.4 per 100,000 population). The current strategy of the Malaria Control Program places priority on control measures in the departments of the northern coastal region, where 70% of the cases occur and where the vectors are not resistant to insecticides currently in use.

Yellow fever has its ecological niche throughout the jungle portion of the Amazon Basin (22 provinces in 11 departments), where the virus continues to circulate due to the presence of the wild vector and the nonhuman primates that serve as a reservoir. Because of an unusual increase in the number of persons coming into and traveling through affected areas, the number of cases rose from 19 in 1982 to 179 in 1987.

Leprosy is endemic in Peru. The disease occurs mainly in the Amazon Basin's jungle areas, where 87% of the patients reside; in addition, 7.6% of the patients are

found in the highlands and 4.5% in the coastal region. In 1988, the total number of leprosy patients was estimated at 9,200. An annual increase of 2.5% is anticipated in the future.

The country's first AIDS case was diagnosed in 1983. As of December 1987, a total of 70 cases had been confirmed. The Technical Commission for Certification, Classification, and Registration of AIDS Cases and the National Multisectoral Program for AIDS Prevention and Control were created in 1987. These entities operate through three subprograms: public information and education, prevention and care of cases, and research. In a national survey on the prevalence of the human immunodeficiency virus, samples of 57,841 persons were processed, and 282 were identified as positive (4.8 per 1,000), which means that the infection has reached an epidemic stage.

Viral hepatitis is widespread. In 1987, 8,843 cases were reported (42.6 per 100,000) in the establishments of the Ministry of Health alone. Children under 5 years accounted for one-third of all cases.

Rabies remains the zoonosis of greatest public health concern in Peru. In addition, control of brucellosis, hydatidosis, and distomiasis has declined due to lack of resources.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

Since 1985, the national health policy has aimed at the democratization of health and at reaching six goals: the public's mobilization and participation, effective decentralization of the health services, multisectoral health action, development of new approaches and technologies, adjustments to the health sector and to the leadership role of the Ministry of Health, and efforts to achieve health for all.

The Ministry of Health helps formulate development plans according to National Planning Institute guidelines. Currently, it is implementing the 1986–1990 Medium-Term Plan. Seven programs and twenty-five subprograms were established in 1988. The seven programs are maternal and child health, adult health, food and nutrition, environmental health, health care delivery, program support, and operations research.

Regarding decentralization, in 1986 departmental health units were established, and the number of administrative areas was reduced to 28. The country's regionalization efforts will strengthen future decentralization.

A 1986 decision undertook the functional integration of the health services provided by the Ministry of Health and those provided by the Peruvian Institute of Social Security (IPSS); this effort aimed at rationalizing the utilization of health resources and increasing their coverage, as well as at initiating a process that would allow the joint utilization of the two institutions' physical infrastructure and human and material resources. The process has advanced slowly and is being evaluated. At this point, eight areas of the country have integrated services.

The Organic Health Law established decentralized multisectoral public agencies. Among the most important are the National Committee on Food and Drugs, the National Council on Environmental Health Protection, and the National Population Council. In 1986, an agreement on technical and scientific cooperation was signed between the Ministries of Education and of Health to enable teachers, parents, and students to work as health promoters. The Office for Community Participation was created within the Ministry of Health. In 1988, the population was called on to participate in the First National Health Congress through its grass-roots organizations.

Production of Services

Medical consultations rose from 27.1 million in 1984 to 40.6 million in 1987 (an increase of 49.9%), as a result of a policy that promoted ambulatory services. During the same period, the number of consultations per person increased from 1.41 to 1.96, and that of hospital discharges, from 719,000 to 895,000 (a rise of 24.4%). The IPSS grew more than the other institutions (50%), mainly because of the expansion of its installed capacity in the provinces. The private subsector saw the least growth (2.9%), as a result of the population's loss of purchasing power.

It is estimated that 40% of the population is not covered by any health service, especially in the rural areas and marginal urban settlements. In 1987, the Ministry of Health served 60% of the population covered; the IPSS, 30%; the Armed Forces and Police health services, 3%; and the private subsector, 7%.

The Ministry of Health's general hospitals had 364,000 discharges, and the average hospital stay was 7.4 days. This figure is influenced by the average stay in obstetric services, which is 2.9 days per discharge. The percentage of overall bed occupancy is low (56.5%), as is bed turnover (27.9 discharges). At the IPSS, the average stay declined from 11.8 days in 1984 to 11.3 in 1986. Bed occupancy has risen from 69.4% to 73.7%, and it is likely that this figure is even greater at present due to the effects of the economic crisis.

Installed Capacity

In 1987, the country had 353 hospitals with 30,629 beds, plus 963 health centers, representing a ratio of 1.48 beds per 1,000 population. This figure is lower than it was in 1980 (1.61 per 1,000). From 1980 to 1987 the number of health centers and health posts increased by 53% and 85%, respectively. The Ministry of Health administers most health establishments and hospital beds: in 1987 it handled 54.0% of the beds, 71.6% of the health centers, and 94% of the health posts. The IPSS accounts for 15% of the beds. In 1986, of a total of 105 Ministry of Health hospitals, 38 (36.2%) had been in operation for more than 35 years and accounted for 54% of the total of 18,846 beds. Maintenance of facilities, equipment, and installations is deficient.

Health Services Technologies

Most health care technology is imported, which makes it both dependent and costly.

In 1985 it was estimated that 90% of all drugs were manufactured in the country. However, 90% of the raw materials used for the production of drugs are imported. In 1986, as a result of an agreement with the pharmaceutical industry, the Government launched the Program of Social Support for Essential Basic Drugs and developed a medicine catalogue of 94 drugs—27 are basic and 67, essential.

The equipment in the Ministry of Health hospitals is in critical condition; nearly 50% of the equipment is not in use because of poor maintenance, overutilization, and age. In the last few years, the Ministry has acquired equipment from more than ten different countries, adding to the variety of types and trade names. The IPSS is in a similar situation, with the additional problem that its large national hospitals utilize highly complex equipment.

The National Institute for Health Development was created in 1987; it promotes and facilitates the coordination and joint action of institutions and individuals who can contribute to health development.

Financing of the Health Services

The Ministry of Health and the health programs of the IPSS absorb 90% of available funds for the public health subsector. The availability of these funds was subject to income from IPSS contributions and Public Treasury allocations to the Ministry of Health. Both sources financed 91% to 98% of all expenditures in the public health subsector, which steadily increased from 1985 until the second half of 1988. In 1988, as a consequence of a deep-

ening recession and inflation, they abruptly declined. The average monthly expenditure of 5.5 million intis in 1985 rose to 11.1 million intis in the first quarter of 1988 and then fell to 5.1 million intis per month in the last quarter of 1988. The annual figures for the 1984–1987 period indicate growth from 67.8 million intis in 1984 to 93.0 million intis in 1987, with a variation of 37.1%. In late 1987 the expenditures of the public health subsector represented 12.3% of total central government spending and 2.72% of the GDP. Between 87% and 93% of the public subsector's resources go for current expenditures.

Funds for Ministry of Health expenditures increasingly depend on the Public Treasury, which in 1988 covered 95.3% of expenditures. During 1984–1987, the Ministry of Health increased spending from 34.9 million intis to 38.2 million intis (constant value), which represents just 9% in the four years.

The two principal IPSS programs are Disease-Maternity and Pensions. In 1984–1987, the Disease-Maternity Program expenditures ranged between 51.8% and 58.1% of total IPSS spending. Currently, IPSS is in a critical financial situation: at the end of 1988 the accumulated deficit was 1.048 billion intis, and the reserves were being depleted. In addition, current expenditures account for 85% to 96% of total expenditures and are on the rise.

Health Planning and Administration

The health sector's managerial capacity has weakened in the last decade. Although the Government has formulated a National Health Policy, its progress is limited. Two of the policy's guidelines are effective decentralization of the health services with delegation of authority and tailoring of the health sector and its institutions and agencies to the health policy guidelines. The managerial capacity also has suffered from a lack of continuity in the political leadership.

Human Resources

The overall availability of health professionals has risen significantly in recent decades. In absolute figures the number of physicians increased more than threefold between 1964 and 1986, from 5,325 to 19,635, while the number of nurses quadrupled in the same period, from 3,163 in 1964 to 14,709 in 1986. These professionals are concentrated in the capital and the other large cities, while there are shortages in other areas. Lima and El Callao have the highest ratio of physicians to population, 21.3 per 10,000 inhabitants, while Apurímac and Amazonas have rates of 0.39 and 0.41 physicians per 10,000 population. Lima has 15 and 16 times more dentists than

Amazonas and Huancavelica, respectively. Arequipa has the highest ratio of nurses to population in the country (17.7 per 10,000 inhabitants).

In 1985 the Ministry of Health had 62,805 employees, 22.5% of which were professional personnel; 5.5%, technical personnel; 31.2%, health auxiliaries; 19.4%, administrative personnel; and 20.8%, service personnel. Contract personnel accounted for 27.6% of all personnel employed (17,310).

In 1986 the country had twelve universities with medical schools—ten State-owned and two private—of which four were based in Lima.

HEALTH AND THE ENVIRONMENT

Along with insufficient water supply and sewerage services to serve the skyrocketing urban population, the country experiences persistent environmental problems due to the inadequate treatment of industrial and agricultural wastes. Environmental legislation is difficult to enforce, and the operational structures have not been brought into line with the processes of regionalization and strengthening of local decision-making.

The National Committee for Coordination of Basic Sanitation (CONCOSAB) is responsible for planning, coordinating, and integrating the efforts of all institutions involved in water supply and sewerage systems. The National Service of Drinking Water Supply and Sewerage (SENAPA), which comes under the Ministry of Housing and Construction, serves the urban areas, while the Division of Basic Rural Sanitation (DISABAR), which comes under the Ministry of Health, serves population centers with fewer than 2,000 inhabitants. The urban water supply and sewerage system programs are the responsibility of SENAPA-affiliated companies and operating agencies. In the rural areas DISABAR builds the works, and the communities administer, operate, and maintain them.

The goals for coverage of drinking water supply for

1995 are 95% for Lima's metropolitan area, 90% for cities with more than 400,000 inhabitants, 80% for localities with 2,000 to 400,000 inhabitants, 75% for concentrated rural populations, and 50% for the scattered rural population. During 1983–1985, investments in drinking water and sewerage came to \$US95 million (5% corresponded to the Ministry of Health). For 1986–1995 the total investment is estimated at \$US935 million.

The National Council for Environmental Health Protection deals with environmental pollution problems and brings together efforts of 41 institutions from various sectors, including the Ministry of Health's Technical Bureau for Environmental Health.

During 1985–1988, urban sanitation studies which will benefit 1,615,000 persons were prepared for Huancaayo, Chilca, Tambo, Ica, Arequipa, Ilo, and Tacna. Studies also were conducted on industrial and hospital wastes in the Lima metropolitan area and a sectoral study of solid wastes in Peru was begun.

The Food Safety and Zoonosis Division of the Technical Bureau for Environmental Health is responsible for sanitary control of food. This is a difficult function to carry out because several sectors are involved and there is widespread street vending of food. The multisectoral and multidisciplinary National Food Safety Program established a Food Registration and Information Unit that is carrying out research on risks involved in the consumption of fish contaminated with *Anisakis* larvae.

Workers' health is the responsibility of the Ministry of Health's National Institute of Occupational Health (INSO), acting through the Occupational Health Department. From 1985 to 1988 it substantially increased the number of INSO professionals who work at the central office in Lima and in the regional units at La Oroya, Arequipa, and Trujillo. The IPSS conducted seminars on occupational health training at some of its provincial hospitals. Six universities now have undergraduate courses in occupational health, including a course in industrial safety engineering in the School of Environmental Engineering at the National University of Engineering.

ST. KITTS AND NEVIS

GENERAL CONTEXT

Political, Economic, and Social Situation

The islands of St. 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 total gross domestic product (GDP) increased from \$US59 million (\$US1,300 per capita) in 1983 to \$US76.5 million (\$US1,670 per capita) in 1986. The economy is based mainly on agriculture (sugar), light manufacturing, and tourism. There were negative balances in international trade throughout 1983–1986. Tourism development has been increasingly emphasized, and this development also has brought about an increase in the construction sector.

Unemployment was estimated at 20% in 1987; there are no accurate data on underemployment. Adult literacy was estimated to be 80% in 1985, with nearly all children aged 5–15 years old enrolled in schools.

Demographic Characteristics

In 1985, the estimated population was 45,800. The population structure is young, with 36.2% under the age of 15 and only 9.1% aged 65 years and over. Thirty-eight percent of the population is estimated to be urban, and this proportion changed little between 1983 and 1987.

The estimated birth rate was 24 per 1,000 population in 1983 and 1985, and 23 per 1,000 in 1986. The estimated fertility rate was 95 per 1,000 women aged 15–44 in 1985 (1,026 births) and 89 in 1986 (1,007 births), with 23% of the births in 1986 occurring in women under 20 years of age.

The annual population growth rate has been low, with natural increases offset by emigration.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

The infant mortality rate was high at 39.7 per 1,000 live births (40 deaths) in 1986, after it had fallen to 30.2 in 1985 (31 deaths). As in previous years, neonatal deaths accounted for more than two-thirds of these deaths in both years—69% in 1986 and 72% in 1987. The main causes of neonatal mortality were prematurity and respiratory distress; diarrheal and respiratory diseases were mainly responsible for later infant deaths. In the 1–4-year-old age group there were ten deaths in 1985 and eight deaths in 1986. There were two maternal deaths in 1985.

St. Kitts and Nevis achieved 100% coverage for DPT and polio in 1986, but slipped back to 96% and 98%, respectively, in 1987; measles coverage was 91% for the last year. Rubella immunization was recently introduced for girls aged 9–11. Other recently introduced activities include administration of tetanus toxoid to selected pregnant women, andrometric testing for schoolchildren, and use of the simplified perinatal clinical record.

Family planning services are offered at all health facilities, and family life education has continually expanded throughout the school system. In addition, special governmental and nongovernmental programs for adolescents aim at reducing the incidence of teenage pregnancy.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Primary responsibility for the health sector rests with the Ministry of Education, Health, and Community Services. The Ministry's administrative structure consists of a Permanent Secretary for Health and Social Services and a Permanent Secretary for Education. Policy decisions for health services are made by the Minister on the advice of the Permanent Secretary. The latter, in turn, is advised by technical officers, including the Chief Medical Officer, responsible for hospital services and community health services, and the Principal Nursing Officer, responsible for all nursing matters.

The national health policy aims at correcting inequities and social disparities in the health care delivery system, institutionalizing community participation, emphasizing primary health care, and improving the efficiency of the managerial process so that all citizens have access to adequate health care regardless of their ability to pay. The policy considers mothers and children, schoolchildren, adolescents, and the elderly as priority groups and focuses on specific health problems with important social, educational, and economic consequences, such as teenage pregnancy, sexually transmitted diseases, dental and mental health problems, diabetes, hypertension, and handicaps. The Government also pursues legislative standards and safe practices to ensure safety in the workplace.

Although not established officially and sometimes overlapping, in practice there are three levels of health care. The first level involves health care outside of inpatient institutions—at and/or from health centers, from general practitioners, and at outpatient departments in general hospitals. The second level provides health care at general hospitals and other inpatient institutions. The third level handles health care at general hospitals and outside the country.

The community health facilities are the main primary care centers, and they have been located according to population distribution. In Nevis the entire population is within three to four miles of a health center; in St. Kitts the distance is less. The overall ratio of population to primary care nurse is 1,410:1. Because physicians carry out various duties, it is difficult to establish the ratio of population per physician for primary health care. All public health services are free.

The health centers provide services in maternal and child health, antenatal care, midwifery, child health, school health, home visits, hypertension and diabetes, minor treatments by physicians, family planning, and health education. These efforts hope to establish a solid health foundation at birth and during the formative years and to ensure the sound mental and physical development of children by providing mothers, infants, preschoolers, and students in each community with wide health coverage and preventive care. Another goal is to coordinate and integrate the preventive and curative aspects of the services dispensed by health centers and hospitals.

Family planning activities are conducted at all 17 health centers. Several methods have been increasingly accepted over the years under review, leading to a decrease in the number of births.

The country has two general hospitals (Joseph N. France General Hospital in Basseterre, with 174 beds and Alexandra Hospital in Sandy Point, with 54 beds) and one "cottage" hospital (Mary Charles Hospital in Molineaux, with 10 beds). In addition, the 100-bed Cardin Home and the 6-bed Hansens Home provide geriatric

facilities. There is no private hospital in St. Kitts and Nevis, but private beds are available in the government hospitals. Patients needing specialist care unavailable in the country are referred to regional Caribbean organizations and institutions. Table 1 shows specific services offered and bed capacity for these services at the two general hospitals. In addition to these services, both hospitals offer casualty and emergency services and outpatient services.

| | Joseph N. France | Alexandra |
|-------------|------------------|-----------|
| Obstetrics | 24 | 6 |
| Surgical | 40 | 17 |
| Medical I | 40 | 17 |
| Medical IIA | 12 | — |
| Medical IIB | 12 | — |
| Pediatrics | 24 | 10 |
| Psychiatric | 10 | — |
| Private | 12 | 4 |
| Total | 174 | 54 |

Occupancy rates for the Joseph N. France Hospital and for the Alexandra Hospital for 1988 were 65.6% and 47.0%, respectively. The average length of stay at Joseph N. France Hospital was 8.77 days and at Alexandra Hospital, 8.66 days. The most seriously ill patients from Nevis and from Alexandra Hospital are transferred to the Joseph N. France Hospital, so comparisons of the two facilities and their statistics are not valid.

According to the Joseph N. France Hospital 1988 annual report, most hospital discharges were for surgery (1,178), followed by general medicine (1,099), obstetrics (983), and pediatrics (889).

Family life education is an integral part of the educational program, and is offered both within the schools and at the teachers' college level.

The school health program was updated in 1985 for full implementation in 1986 and 1987. The aims of this program range from helping students achieve the best possible physical and mental health to health promotion and disease prevention activities. Some components of the school health program are dental care; health and family life education; control of communicable diseases and immunization; school food program; nutrition surveillance; finding, investigating, and supervising handicapped children; and environmental health surveillance counseling. Activities include medical examinations at

ages 5 and 11, and before children leave school. All health problems are referred to the district medical offices.

Hypertension and diabetes clinics have been established; diabetics receive insulin daily at the health centers, and the nurses administer insulin on nonworking days and on public holidays. Home visiting by nurses in the different districts is a vital aspect of the public health nursing services.

Activities introduced between 1983 and 1987 include glaucoma screening, placing family nurse/practitioners in specific areas, the measles immunization program, use of the Caribbean growth chart, screening for hearing loss, and perinatal record-keeping.

In 1986, the Ministry of Education, Health, and Community Affairs' estimated expenditure of \$US24,590,000 accounted for 28.6% of the total budget. Health alone showed an estimated expenditure of US\$2,946,000.

HEALTH AND THE ENVIRONMENT

As the country's economic base shifts from sugar to tourism and nontraditional crops, development and the environment become issues of grave concern for local decision-makers.

On St. Kitts, 43% of the population has house connections for drinking water; on Nevis, 24% does; 91% of the population on both islands has some type of sewage disposal facility.

Recent increases in solid waste generated in St. Kitts by light industry in suburban Basseterre and by tourist facilities in Frigate Bay have added to disposal problems. Clearly, the collection, transportation, and disposal of solid wastes require more attention and resources; the two coastal dumps in St. Kitts should be closed down.

Without a sewerage system, domestic wastewater in Basseterre runs off into the sea from street canals and open drains. Elsewhere, light industry produces wastewater that also may pollute public places and coastal waters. In rocky areas, excreta disposal by pit privy is a problem, and some buildings are too densely located to allow for individual sewage/excreta disposal facilities for each building.

Structural problems underlying the solid and liquid waste disposal include a lack of public awareness of environmental health; shortage of financial, manpower, and other resources; and inadequate land-use planning and development controls.

A broad effort to achieve a more structured environmental management program that now receives external assistance from CIDA, USAID, and other agencies, is likely to strengthen the country's overall environmental health program. The country also has benefited from external assistance in areas such as solid waste management, water supply, and environmental impact assessment. A UNDP/CARICOM regional sewerage studies project for urban areas in Eastern Caribbean countries will provide a preliminary study and design for a Basseterre sewerage system.

Activities of the public health inspectorate include training in solid waste management, rodent and insect control, food hygiene, environmental sanitation, and water quality control. The purchase of new vehicles has led to improvements in solid waste management. Water quality control is another aspect of the health services delivery system.

In the capital, Basseterre, a small vector control program treats only positive foci. In the districts, public health inspectors respond to complaints about mosquitoes when the need arises. The most recent (1988) *Aedes aegypti* household index in Basseterre was 16.6%.

SAINT LUCIA

GENERAL CONTEXT

Political, Economic, and Social Situation

Saint Lucia is a constitutional monarchy with a system of government based on a parliamentary democracy. The Government of the United Kingdom is represented in Saint Lucia by a Governor General; the head of the Government is the Prime Minister. The Prime Minister appoints the Cabinet, which has executive functions and which is responsible to Parliament and, through Parliament, to the people. General elections are held at intervals not exceeding five years.

The economy of Saint Lucia has expanded. Per capita GDP increased from \$US1,050 in 1983 to \$US1,404 in 1987. The economy is based upon agriculture, with bananas being the chief export crop; there is also tourism and light manufacturing. From 1984 to 1987 exports have exceeded imports for a positive trade balance.

The external debt in 1986 was \$US48.2 million with a debt service ratio of 23%. Structural adjustment policies have been adopted by the Government to reduce the proportion of GDP using public expenditure (29% in 1987). The inflation rate was about 2% for 1986. The national currency exchange to the US dollar is 2.7 and is quite stable.

Unemployment is high (around 25% of the work force). There is a literacy rate of 80%.

Demographic Characteristics

The population grew from 136,950 in 1985 to 142,400 in 1987. The population structure is young, with 44.4% under 15 years of age (1987) and only 5.6% aged 65 and over. Around 38% of the population is urban. The birth rate, although high, has been decreasing: it was 31 per 1,000 inhabitants in 1985 and 27 in 1987. Fertility rates have been consistently high: 152 per 1,000 women 15–44 years of age in 1985, 144 in 1986, and 135 in 1987.

Of all live births, 25% were to women under age 20 in 1986 and 23% in 1987. Some decline in the number of births to teenage mothers has been observed, from

over 1,000 yearly from 1981 to 1985, to 970 in 1986 and 879 in 1987.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality

The crude death rate for 1985 was 6.4 per 1,000 inhabitants. It was higher for males (7.0 per 1,000) than for females (5.7 per 1,000).

Health Situation of Specific Population Groups

Child Health

The infant mortality rate was 23.0 per 1,000 live births in 1985 (99 deaths), 19.7 in 1986 (79 deaths), and 19.8 in 1987 (76 deaths). The neonatal mortality rate ranged between 13 and 16 per 1,000 live births during the period. The stillbirth rate fluctuated between 8.8 and 12. The mortality rate for the 1–4-year-old age group was about 1.1 per 1,000 population for 1985–1987 (18 deaths in 1985 and 19 in each of the following two years).

Principal causes of infant death were prematurity, respiratory disease, congenital anomalies, and gastrointestinal infection; accidents were an important cause of death in older children.

Immunization coverage in children under 1 year old was excellent: 100% for DPT and polio, and 96% for measles in 1986. Oral rehydration therapy is regularly used, and both deaths and hospital admissions for diarrheal disease have declined.

Health of Adolescents and Adults

Heart disease, malignant neoplasms, and cerebrovascular disease, in descending order, have been the three main causes of death since the beginning of the decade. The category "Accidents and Adverse Effects" has been steadily rising as a leading cause of death, largely due to

the increasing death toll resulting from motor vehicle accidents. These accidents are now the main cause of death in the 25–34-year-old age group, and it was estimated that in 1985 they accounted for 960 years of potential life lost (YPLL). Hypertension and diabetes are two of the most common of the noncommunicable diseases and their contribution to mortality is very likely to be much greater than their positions on a ranking list would indicate. Training of community-based health personnel and other activities have been undertaken in recent years to improve the control of these health problems.

There were two maternal deaths from 1985 to 1987. Family planning services are available at all health centers, and they are supported by family life education activities in the community carried out by a team of family life educators from the Bureau of Health Education.

There has been increasing emphasis on adolescent health, particularly through the strategy of peer counseling.

Mental health care has expanded; in addition to hospital outpatient clinics, there are island-wide community psychiatric clinics. Major reasons for admissions to the psychiatric hospital have been listed as abuse of alcohol and other drugs, and schizophrenia.

There is a structured program for disabled persons which utilizes the community-based approach. It is believed that over 90% of the disabled are covered by this program.

Health of the Elderly

The elderly constitute approximately 6.5% of the total population. There is little documented information on the status of the health of the elderly.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

The Ministry of Health, Housing, Labour, Information, and Broadcasting (Ministry of Health) is responsible for the provision of public health services in the country. Policy decisions for the health services are made by the Minister of Health on the advice of the Permanent Secretary for Health and the senior technical officers. Saint Lucia's health system has developed over several years using the concept of four levels of care based on the Ministry of Health's draft "Health Policy and Health Development Plan, 1986–1991."

Level I care is provided by environmental health officers, community health nurses, family nurse practitioners, and their aides, and takes place in the community. Level II care is provided at the health centers by the community health nurses, family nurse practitioners, and their staff.

Level III care is provided by the district hospitals. Level IV care is provided by Victoria and St. Jude Hospitals, and specialty hospitals such as Golden Hope Mental Hospital.

Health promotion activities aim at fostering behavioral and environmental conditions that can contribute positively to health. These activities are mainly undertaken by the Bureau of Health Education. Preventive activities are directed not only against communicable diseases but also against other preventable conditions. They include, in addition to immunizations, such interventions as supplementation and fluoridation.

The primary health care services are delivered through a network of 33 health centers on the island, strategically located so that no person is more than three or four miles from a center. There are also two district hospitals, one in Soufriere and one in Dennery, that provide primary health care. Many of the health centers also have been designed to serve as obstetrical units for normal deliveries.

The secondary health care services are provided by five hospitals on the island with a total bed complement of 539 beds, 114 of which are privately owned (St. Jude). Victoria Hospital is a 211-bed facility offering most secondary level inpatient services and a casualty/outpatient department. The Golden Hope Hospital, a former military barracks, is a 162-bed psychiatric facility in Castries. The Soufriere Hospital has 32 acute beds, including a recently constructed 10-bed maternity unit. Dennery Hospital has 20 beds. The overall occupancy ranges from 20% in the small hospitals to 80% in the larger ones.

Saint Lucia is currently preparing technical and management studies and projects to build a new national hospital.

The Ministry of Health operates three laboratories: one public health laboratory located at the Castries health center and two diagnostic laboratories located at each of the general hospitals. The Ministry of Agriculture also operates a veterinary public health laboratory.

A medical supplies officer is responsible for the storage and provision of drugs for all government dispensaries and/or pharmacies.

Regarding human resources, in 1988 Saint Lucia had 68 physicians (4.7 per 10,000 inhabitants), 196 registered nurses (13.5), 91 practical nurses (6.3), 17 nursing aides (1.2), and 9 dentists (0.6). There were also 5 veterinarians, 26 pharmacists, 28 health inspectors, 1 nutritionist, and 1 social worker. Except for physicians, the number of health personnel has been fairly stable in the last four years. Physician numbers increased from 40 in 1985, to 49 in 1987, and to 68 in 1988.

Most of the available health personnel work in the public sector, and 26 physicians also have private practices. About 80% of the physicians and the dentists are male, and all the nurses are female. Most of the registered

nurses, about half of the dentists, and one-third of the physicians are located in urban areas. Almost all the nursing aides are in the rural area.

For training there is only one nursing school, where 30 graduates and 25 practical nurses were trained in the last four years.

HEALTH AND THE ENVIRONMENT

The supply of drinking water still falls short of the national demand, and water is being contaminated by the use of agro-chemicals without proper watershed management. The main solid waste problems are the increased generation of wastes, excessive urban littering, countryside dumping, and unsanitary disposal in a coastal area just north of Castries. Although the capital city of Castries is sewered, city sewage is discharged raw into inshore coastal waters, which also receive the partially treated sewage from coastal hotels. The situation with respect to

other communities in the north and south is similar.

The underlying structural problems include: fragmentation of responsibility, lack of institutional considerations, low level of environmental awareness, and poor land use and development controls. Nevertheless, the valuable role of legislation in environmental health management is increasingly appreciated, and efforts are being made to upgrade and utilize the broad range of environmental legislation.

A vertically structured vector control program provides regular coverage of inspection and focal/perifocal treatment in the capital, Castries. An integrated, community-based project was carried out in two rural villages in 1986 and was expanded to incorporate two other communities in 1988. In Castries the latest available *Aedes* household infestation index (1987) was 2.3%.

Saint Lucia is the location of the Caribbean Environmental Health Institute (CEHI), the Eastern Caribbean Natural Area Management Program, and the Natural Resource Management Program for the Organization of Eastern Caribbean States.

ST. VINCENT AND THE GRENADINES

GENERAL CONTEXT

Political, Economic, and Social Situation

The country, which gained independence from Great Britain in 1979 and is now governed by a Westminster type parliamentary system, includes the main island of St. Vincent and most of the Grenadine island chain.

The economy has been affected by global economic difficulties, by the contraction in CARICOM trade, and by price fluctuations in the country's primary products. Per capita GDP increased from \$US850 in 1983 to \$US930 in 1985, but fell to \$US880 in 1986. Agriculture remains the mainstay of the economy, and exports are mainly to the United Kingdom. Although the sugar industry collapsed in the early 1980s, banana production has increased; tourism has been increasingly emphasized. In an effort to revive the economy, structural adjustment policies have been established. In 1986, unemployment was estimated to be at least 40%. Public service is a major source of employment.

The external debt in 1986 was \$US28.9 million. Public expenditure was as high as 52% of GDP in 1984 and decreased to 41% in 1986. The rate of inflation has fallen from 5.7% in 1983 to 1% in 1986 and remains low. The adult literacy rate is 80%.

Demographic Characteristics

Total population was estimated to be around 111,000 in 1986. The population is young, with 40% under the age of 15 years and only 3.9% aged 65 and older. The birth rate fell from 32.6 per 1,000 population in 1983 to 25.7 in 1986. The fertility rate was 128.8 per 1,000 women 15-44 years old in 1985 and 108.7 in 1986. The last census was in 1980, and available population data are based on estimates which are not always consistent.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

The death rate was 6.3 per 1,000 population in 1985 and 5.9 in 1986. During that last year, the death rate was slightly higher for males (6.1) than for females (5.7). In 1986, 7.4% of all causes of death were recorded as symptoms and ill-defined conditions.

Health Situation of Specific Population Groups

Child Health

The infant mortality rate was 60 per 1,000 live births in 1980, and it has steadily declined since then to 25 in 1986 and 24 in 1987. Among the principal causes of death are prematurity, respiratory distress and other disorders, and congenital anomalies.

In the 1-4-year-old age group there were 11 deaths in 1985 and 17 in 1986; respiratory tract infections were the leading cause of death.

Coverage for both DPT and polio immunizations in the under 1-year-old age group reached 95%; coverage for measles was 88%. A successful oral rehydration program has resulted in a sharp reduction in mortality from diarrheal disease—only one death from diarrheal disease was recorded in the two-year period following implementation of the program.

Health of Adolescents and Adults

Chronic noncommunicable diseases account for most health problems among adults. Hypertension and diabetes, two of the most prevalent disorders, in 1984 oc-

cupied the first and sixth positions, respectively, among the ten most common disorders seen at clinics. The ranking of heart disease and cerebrovascular disease as the first and third causes of mortality bears testimony to the impact of hypertension. Efforts are being made to improve the control of these disorders within the primary care approach.

Malignant neoplasms constitute the second main cause of death: gastric cancer (both sexes combined) and cervical cancer (among women) are two of the leading malignancies.

A single maternal death, due to eclampsia, was recorded between 1986 and 1987. There was a drop in births to teenagers, from 883 (30% of total births) in 1985 to 674 (24.5%) in 1986. A promising trend toward earlier antenatal care has been observed; however, the drop-out rate in the active family planning program persists.

In recent years, the number of persons aged 15–25 who are being treated for mental health problems related to substance abuse has noticeably increased.

Adolescent health activities have expanded, and seven health centers now offer services.

Health of the Elderly

Although the elderly constitute almost 4% of the population, information on the health status of the elderly is lacking. There is a geriatric institution for the homeless.

Problems Affecting the General Population

The ten major causes of illness seen at clinics in 1984 were hypertension, the common cold, helminthiasis, scabies, other skin conditions, diabetes, arthritis, gastroenteritis, anemia, and bronchitis.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Responsibility for the provision of public health services lies within the Ministry of Health. Policy decisions for the health services are made by the Minister of Health on the advice of the Permanent Secretary, who has responsibility for the daily administration of the Ministry, and of senior technical officers. The Minister is responsible to the Cabinet of Ministers for the provision of government health services.

There is no written policy statement regarding primary, secondary, or tertiary levels of health care. The National Health Plan (1982–1986) stresses the aim “for a totally integrated service in which various levels of care are not

only interdependent, but they orchestrate with one another for the accomplishment of the goal of health for all.”

Although the National Health Plan mentions the elderly, the poor, and the handicapped as priority groups, no specially organized health program exists for any of these groups apart from the geriatric hospital and the school for children with special needs.

The health system is structured, organized, and managed along three main categories: clinics/health centers/hospitals, medical/health districts, and Ministry of Health headquarters.

The first category of health services is provided at the community or village level, where basic services offered by health clinics or health centers through the team approach utilize all community resources. This care represents the first point of contact of the individual with the health system.

The medical/health districts, the health system’s second category, are where coordination and planning take place; they provide a liaison between the central level and those services which cannot be found in every village. The district also serves as the base for local programming, management, supervision, and financial control. At this level, programs proposed by the control level of the Ministry of Health are analyzed and adjusted to suit the specific needs of the community. The island of St. Vincent has been divided into seven medical/health districts. The Grenadines are grouped into two districts—one in Bequia and the other in Union Island.

The functional organization of the primary care services is by districts, and care is delivered by a health team consisting of all the health workers at a district level. It is managed by a committee under the control of a medical officer, plus, depending on the district, a health visitor, an environmental health officer, and a family nurse practitioner. The team is responsible for preventive, promotional, curative, and rehabilitative services. Each district medical officer has responsibility for an average of four clinics, which essentially means providing health care services to approximately 12,000 persons. There are nine district health officers in the country. The ratio of public health inspectors is 1:4,700 population.

The third category of the health system is the central level of the Ministry of Health. Policy decisions are made at this level. The central level is responsible for looking at trends; forecasting; ensuring the consistency of plans, objectives, standards, and criteria; policy formulation and ratification; and the impact of district programs on the total health care delivery system.

Primary health care services are delivered through a network of 35 clinics or health centers and 1 health center in Kingstown, strategically located so that no person is more than three miles from a health center. In terms of

community outpatient services, there are 31 rural clinics on St. Vincent and 5 in the Grenadines. Each health facility provides services to an average of 3,005 persons.

Community health facilities are normally established based on an area's population and on the distance between facilities; consequently, there is no standardization with regard to population per facility. A well-established policy sets each clinic's staff as one nurse/midwife, one nurse assistant, and one community health aide. Community health aides are essentially field workers, but they operate under the direction of the district nurse/midwife. In addition, the work of the staff in each clinic is supported by a senior public health nurse, a district medical officer, a pharmacist, and a public health inspector.

Each health facility provides emergency care, antenatal and postnatal care, midwifery services, child health services including immunization, family planning services, and communicable and chronic disease control services.

The main general hospital (204 beds) is located in Kingstown. The Government administers a leprosarium (20 beds), a geriatric home (120 beds), a mental health center (120 beds), and four small rural hospitals (12 beds each). There is a small private sector which includes a general hospital in the capital (12 beds) that delivers health care at various levels. Altogether, there are 528 hospital beds in St. Vincent and the Grenadines, an average of 48.8 beds per 10,000 population. Most (52.2%) are classified as general, acute-care beds. Hospital outpatient services are routinely provided.

Perhaps the most pervasive problem confronting the health system during 1985–1988 is the inadequacy or lack of quantitative or qualitative data. Development of an efficient information system is a priority.

HEALTH AND THE ENVIRONMENT

The disposal of solid waste by sanitary landfill outside of Kingstown is not satisfactory. The program itself receives insufficient support from the Government and from the people.

The core of Kingstown is sewerred, but sewage is untreated and disposed of near the harbor. Designs for an extension of the sewer system exist, but due to the lack of funds construction work has never been started.

Throughout St. Vincent and the islands the discharge of liquid and solid wastes by visiting yachts is becoming a major problem. This is directly related to such structural weaknesses as institutional incapability, weak legislative base, and lack of environmental education.

With assistance from the Caribbean Development Bank and PAHO, the Water Agency is evolving into a stronger Water and Sewerage Authority with well-trained staff, legislative authorization, and political support. The political will, legislative base, and public interest in resource management exist and are likely to influence improvements in environmental health within the foreseeable future.

Regarding the vector-control program, two island-wide inspection and focal treatment cycles are conducted annually. Fogging is carried out periodically whenever justified. A project to assess the potential of *Toxorhynchites moctezuma* as a biocontrol agent was conducted on Union Island during 1988. A Peace Corps Volunteer attachment is strengthening the integrated approaches of the program. The latest *Aedes aegypti* household infestation index (1988) was 11.9%.

SURINAME

GENERAL CONTEXT

Political, Economic, and Social Situation

Suriname became independent from the Kingdom of the Netherlands on November 25, 1975. The first elections were held in October 1977, and the elected Government stayed in power until a military coup on February 25, 1980. Suriname returned to democracy with free elections in November 1987, and a new Government was installed in January 1988.

The country has a National Assembly with 51 delegates elected from ten electoral districts. The National Assembly elects the country's President and Vice-President, who also serves as the Prime Minister. The President selects his Cabinet from within or outside the National Assembly. There are nine political parties.

At the time of independence, the Netherlands granted a ten-year development aid package of f.200 million annually. However, as of March 1989, the almost \$US1 billion in aid which had been held in reserve had not yet been released, even though each sector has a development plan and the Government has a five-year development plan. Given the country's small population, which makes foreign currency shortages such a critical problem, whether or not this aid is released will remain a key issue.

As a result of many factors, the country's economy has undergone an accelerated decline during the last several years, especially due to the political unrest in the interior and a chronic shortage of foreign currency. Overall production declined 7% in 1987, with mining being particularly affected. With the accompanying drop in production, unemployment soared, affecting almost 34% of the total work force. Because Suriname is so dependent on imports, the meager foreign exchange resulted in a scarcity of a wide range of goods. This scarcity, coupled with excessive levels of financial liquidity, drove consumer prices increasingly higher.

Production in the mining sector (which accounts for almost 75% of total export earnings) fell dramatically, dropping by as much as 45% in recent years; however, an increase in the price of alumina helped offset the severe production decline. Unemployment hit the mining sector with increases of 12% and 20% in 1986 and 1987, re-

spectively. Agricultural and manufacturing production also have declined over the last several years.

These and other factors led to a large and growing fiscal deficit, greater than 28% of the 1987 gross domestic product (GDP). The same situation was recorded in 1986. Over the last few years, expenditures have continued to grow, reaching 57% of the estimated GDP in 1987; at the same time development investments declined sharply to less than 1% of GDP. The long-term debt stabilized somewhat due to difficulties in obtaining external loans. However, given the absence of external financing, the Government was forced to cover the deficit from its Central Bank, substantially adding to inflationary pressures.

The Government continues to be the major employer, accounting for more than 40% of the labor force; agriculture accounts for 16.7%; manufacturing for 10.6%; mining for 4%; and construction for 2.9%.

The total GDP for 1989 was Sur.f.1.78 billion. (The official rate of exchange is \$US1 = Sur.f.1.77.) The per capita GDP for 1987 was Sur.f.4,880.

The overall national literacy rate stands at 80.2%; illiteracy is considerably higher in the interior.

The country's interior has been defined as the territory south of 5° N latitude, and covers 130,000 km², or 80% of the country's total land area. The population in the interior, consisting of Amerindians and Bushnegroes and amounting to about 10% of the total population, lives in villages dispersed in the jungle, often along the banks of the major rivers. These villages are only accessible by air from the capital, Paramaribo.

Demographic Characteristics

According to the 1980 census, the country had a population of 355,240, with more than 50% under 20 years of age and approximately equal proportions of males and females. Since then, large-scale emigration has left a disproportionate number of females in the different age groups. The distribution by race in 1980 was Creole 39.1%, Hindustani 37.8%, Indonesian 18.4%, Chinese 1.7%, Indian 1.5%, European 0.5%, and others 0.9%; these percentages still hold. Despite the small size of the country's population, at least six distinct languages are

spoken in Suriname. Most people (65%) live in urban settings.

From 1984 to 1987 the crude birth rate dropped from 30.4 per 1,000 population to 24.6, the crude death rate declined from 7.5 per 1,000 to 6.3, and the annual rate of population growth dropped from 2.3% to 0.6%. The fertility rate for Suriname is now estimated at 128.4 per 1,000 women of childbearing age.

Visa reforms have slowed down emigration to the Kingdom of the Netherlands, and migration from the interior to the city also has decreased.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

The crude mortality rate was approximately 7 per 1,000 population per year for 1981–1986. Life expectancy at birth was 67.3 years in 1979, 64.5 in 1980, and 66.8 in 1981.

Medical cause-of-death certification coverage and quality have varied over time, by age and ethnic group, by place of death, and by cause. Since 1986–1987, noncertification of deaths in hospitals has increased—in one large hospital only half the deaths in 1986 were properly certified. Medical certification of deaths decreased yearly from 1982 through 1986: for those years it was 97%, 89%, 84%, 81%, and, finally, 76% in 1986. In the sparsely populated tropical rain forests and savannahs of the country's interior, 57% of certified deaths in 1984 were due to symptoms and ill-defined conditions; in the more populated coastal strip, 13% were in this category. In 1982, 1983, and 1984 a combined total of 7,354 certified deaths were counted, with an overall percentage of deaths from ill-defined causes of 14.6%.

Of the 6,282 deaths from defined causes, 30% were attributed to diseases of the heart, cerebrovascular accidents, and diabetes mellitus; 12% were attributed to accidents and suicide. Of particular concern is the fact that in 1982–1984, conditions originating in the perinatal period were identified in almost 14% of all deaths from defined causes. This figure could be even higher, because many early neonatal deaths are reported as stillbirths. Estimates of infant mortality rates per 1,000 live births, corrected for undercertification of deaths, are: 27.4 in 1982, 28.3 in 1983, 32.5 in 1984, 29.4 in 1985, and 35.0 in 1986.

The ten leading causes of death in the country have not changed much in recent years. As a result of the lower percentage of medically certified deaths in 1986, almost all cause-specific mortality rates declined that year in comparison with those in 1985. The mortality rate for diabetes mellitus increased, however, possibly as a result of the scarcity of insulin and other medications in 1986.

One of the most visible changes in mortality patterns in recent years has been an epidemic of suicidal paraquat intoxications. There has been a change in methods used in suicides since 1980; before 1980, hanging and ingestion of acetic acid (concentrated vinegar) were the most commonly used methods.

In March 1980 the Government prohibited over-the-counter sales of concentrated acetic acid, which resulted in a dramatic decline of suicidal deaths due to ingestion of this substance. Beginning in that year, however, the number of suicidal deaths due to ingestion of agricultural poisons increased steadily, peaking in 1984 and declining steeply in 1985–1986, presumably due to scarcity of agricultural poisons since the beginning of that period.

In 1976–1980 the ingestion of agricultural poisons accounted for 20% of suicidal deaths; in 1981–1984, 69% of suicidal deaths resulted from ingestion of agricultural poisons. The number of deaths by suicide rose precipitously between 1980 and 1985, and the male/female ratio increased steadily in this period. Most of the suicides by agricultural poison were among young East Indian males.

Seventeen primary health care centers in different parts of Suriname function as sentinel stations for epidemiologic surveillance of communicable diseases; their reports are based on clinical diagnosis. Ten medical specialists and five private physicians are telephoned once a week and asked about the numbers of patients they have seen or admitted to hospitals with serious infections, conditions, and syndromes. On a sample of reported cases more detailed case investigations are done.

The emergency medicine department of the Academic Hospital reports the number of intoxications on a weekly basis. Specialized services report on tuberculosis, leprosy, malaria, and schistosomiasis.

Morbidity patterns reported by primary health care centers differ by geographic area and location due to differences in the socioeconomic and ethnic characteristics of the population, differences in diagnostic procedures and medical classification schemes, and circumstances such as the availability or accessibility of other health care services and sanitary facilities. However, at three primary health care centers, the most frequent reason for doctor-patient contact was diseases of the respiratory tract, followed by diseases of the skin. Gastrointestinal diseases ranked third in two of the centers and fourth in the other.

Health Situation of Specific Population Groups

Child Health

In 1980, about 13% of live births at the 's Lands Hospital in Paramaribo (where over 40% of the children in Suriname are born) had a birthweight of less than 2,500 grams. The mean birthweight was 3,061 grams; mean birthweights in 1980 were lower in the interior. Parity and ethnicity were shown to influence the incidence of low birthweight: the highest proportion of low birthweight occurred among children of East Indian and Indonesian women of zero parity (Table 1). Among East Indian children the prevalence of low birthweight is 25%. In recent years (1985–1987), low birthweight levels have ranged from 11% to 13%. From December 1986 to January 1987, 112 births in the Academic Hospital were studied in a perinatology pilot survey, and median birthweight was found to be 2,880 grams. The high proportion of East Indians (39%) and primigravidae (32%) in this sample could be the reason for this relatively low figure.

Anthropometric surveys show the following picture: mild to moderate prevalence rates of malnutrition in the overall population; greatest risk after the first year of life; higher prevalence of malnutrition in East Indian and Indonesian children and in the interior.

Most deliveries in Suriname (80%) take place in the Paramaribo hospitals. In 1981–1986, half the infant mortality (under 1 year of age) was attributed to perinatal problems. While the national perinatal death rate in recent years has been about 30 per 1,000 live births (corrected for undercertification), rates vary depending on place of birth.

In 1985, 141 children died in the first week of life. Of these, 84% died of conditions originating in the perinatal period. Most of these deaths (45%) were related to pre-

maturity; other causes were obstetric complications, birth trauma, and hypoxia/asphyxia.

The most frequent reasons for hospitalizations in the first month of life were conditions originating in the perinatal period (64.3%). These are more frequent among East Indian and Indonesian children than among Creole and Bushnegroe children. The most frequent reason for hospitalization of children 1–11 months of age was gastroenteritis (29.4%). This is in accordance with national mortality data showing that gastroenteritis is the leading cause of death in children under 1 year of age. Among children 1–4 years of age accidental injury (22.2%) was the leading cause.

In 1982–1986 the mortality rate from diarrhea in the age group 0–11 months varied between 2.0 and 4.1 per 1,000 live births, and in 1–4-year-olds it fluctuated between 19.2 and 35.7 per 100,000 children. Reports from sentinel stations have established a seasonal trend whereby most cases of gastroenteritis among 0–4-year-olds occur in June, July, and August, with a second peak in December, January, and February. Although considerable differences in incidence rates were seen for different areas of the country, these rates could not be clearly interpreted due to the difficulty in establishing target populations in each sentinel station. In 1987, a total of 598 children (52.8% were under 1 year of age) with diarrhea were hospitalized in the four main Paramaribo hospitals for an average of two weeks.

During the 1985–1986 school year, 5,443 children from the first and sixth classes (ages 6–8 and 12–14 years) in 32 schools were weighed and measured; 16% were below the tenth percentile (U.S. National Center for Health Statistics standards) and 7% were below the third percentile for weight-for-height. In 1987–1988, 3,690 children were measured in 34 schools, and the same results were obtained. Unfortunately, the age and rate distribution of the children is not known for either study, and the schools are not representative.

| Ethnic group | Parity | | | | | | | Total |
|--------------|--------|------|------|------|-----|-----|------|-------|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6+ | |
| All groups | 39.5 | 19.8 | 12.9 | 8.4 | 5.7 | 4.2 | 9.5 | 100.0 |
| Creole | 29.1 | 20.9 | 19.8 | 10.5 | 7.0 | 1.2 | 10.5 | 100.0 |
| East Indian | 44.6 | 20.8 | 7.7 | 7.7 | 6.2 | 4.6 | 8.5 | 100.0 |
| Bushnegroe | 26.7 | 6.7 | 20.0 | 6.7 | 6.7 | 6.7 | 26.7 | 100.0 |
| Indonesian | 54.5 | 22.7 | 9.1 | 4.5 | — | 9.1 | — | 100.0 |
| Others | 50.0 | 10.0 | 20.0 | 10.0 | — | — | 10.0 | 100.0 |

Source: Family Health Unit, Ministry of Health.

Between 26% and 29% of primary schoolchildren in Paramaribo examined by the school health service during 1985–1987 were referred to a general practitioner or to the dermatology service. Medical screening of schoolchildren shows a high prevalence of skin diseases and dental caries. Children also were referred to the medical psychology service for evaluation of learning disabilities and behavioral problems; 32.7% of these children were referred from there to schools for the mentally retarded.

A pattern has emerged at Suriname's school for the deaf: during the last three decades the birth years of children admitted to the school clustered in seven-year "epidemics." This phenomenon could be the result of rubella epidemics.

The Expanded Program on Immunization started in the country in 1976 with the vaccination of children under 1 year of age against diphtheria, pertussis, tetanus, and poliomyelitis. After a measles outbreak in 1980, measles vaccination was included in the routine immunization schedule. Rubella vaccine is given to girls in the first year in grammar school.

There has been a decline in coverage since 1986, mainly due to the fact that the war in the interior has cut off a large portion of the target population from services. Surinamese children in French Guiana refugee camps are vaccinated with the help of French medical authorities, but data on coverage are not available.

The drop-out rate for DPT vaccination has been declining since 1981. More children who start the program complete their schedule before their first birthday, which indicates that the immunization activities have not come to a standstill.

Suriname has joined the effort to eradicate wild poliovirus from the Americas by 1990, and since 1987, poliomyelitis surveillance has intensified. The last case of laboratory-confirmed polio in Suriname, a case of vaccine-related polio type III, was in 1982. In 1987, 12 cases were followed up; 11 were discarded as nonpolio and one case was inconclusive. In 1988 there were 16 cases of suspected polio, of which 6 were probable cases. Of the latter, four were discarded, one is still inconclusive, and one meets the WHO case definition because of residual paralysis of the lower extremities (with negative laboratory findings).

The number of hospitalizations for tetanus has declined from eight cases (including two of tetanus neonatorum) in 1984 to three cases (including one of tetanus neonatorum) in 1988.

The sentinel stations reported 5 suspected cases of clinical measles in 1987 and 58 in 1988. Between June 1988 and January 1989, the sentinel stations also reported an increase in mumps cases and increases in reported cases of meningitis and encephalitis admitted to hospitals.

Health of Adolescents, Adults, and the Elderly

In males 15–44 years of age, about 50% of certified mortality is due to external causes such as accidents, suicides, and homicides. The number of deaths due to homicides, legal interventions, acts of war, and unspecified violence has increased yearly since 1980.

In recent years there has been a steady decline in the numbers of cases of sexually transmitted diseases seen at the country's two STD clinics. Possible explanations for this phenomenon include: a decline in the incidence of gonorrhea because of the AIDS education campaign; more gonorrhea patients being treated at private and state primary health care centers because of the normalization of drug supplies; and avoidance of STD clinics because of fear of HIV testing.

As of July 1, 1988, there have been 11 confirmed cases of AIDS in Suriname. Six were Surinamese nationals and five were foreigners; all died. The average age was 38 years and the male/female ratio 2.7:1. Of the more than 600 sera from a population-based survey tested at the laboratory of the Caribbean Epidemiology Center, 3% tested positive for antibodies against HTLV-1 (3.8% of females and 2.2% of males).

There also have been 16 reported cases of AIDS-related complex: 14 are foreigners and 2 are Surinamese nationals; the average age is 34.6 years; and the male/female ratio is 2.2:1. Six have died and four are currently being treated by a physician. (Exact updates are unavailable, because some of these persons have since left Suriname.) To date, ten cases of asymptomatic HIV infection have been identified—six were found through surveys, three were sexual contacts of HIV positives, and one was identified after hospitalization with aspecific infections. Nine are Surinamese nationals and the mean age is 34.6, varying between 21 and 51.

Of the 27 cases of AIDS and AIDS-related complex that were reported as of July 1, 1988, 12 (44%) resulted from heterosexual transmission, 2 from homosexual transmission, and 1 from intravenous drug abuse; in 12 cases, the transmission route was unknown. Homosexual transmission is probably underreported because of the social stigma on homosexuality in Suriname.

The maternal death rate per 10,000 live births was 7.0 in 1984 and 6.0 in 1985; the rate for 1986 is estimated at 8.8 after correction for undercertification of deaths. Of women delivering in primary care centers in 1987, 31.8% had anemia and 57% had not received any nutritional education. It is estimated that teenage pregnancies account for 18%–20% of all pregnancies in the country. A survey among 42 pregnant girls in the 13–20-year age group concluded that there was a lack of communication at home with regard to sex education.

In 1980, 5.5% of the population was aged 65 or over and 6.3% was 60 or over. More recent data are not available. In 1987, diarrhea epidemics occurred in two homes for the elderly, causing hospitalizations and deaths. Because of these and other undesirable effects of institutionalization, the Government's policy is to improve care for the elderly within the community.

A 1987 census of the elderly (60 and older) in one community revealed percentages of the elderly with the following medical and physical conditions: chronic diseases, 45%; physical handicaps, 37%; problems with vision, 20%; difficulty walking, 15%; and problems with hearing, 5%.

Problems Affecting the General Population

The war in the interior, which began in February 1986, has seriously affected the medical mission and the population. Many health posts were closed or destroyed in 1986 and 1987, and radio communications and transport of supplies, patients, and personnel by land, rivers, and air became impossible. Economic activities in the hardest hit areas stopped. The people fled to Paramaribo and French Guiana or were evacuated: around 12,000 refugees went to Paramaribo and some 13,000 refugees went to French Guiana, where 8,480 people were living in camps as of September 1988.

Most of the refugees in Paramaribo were integrated into the community, and only about 350 people were housed in seven special centers. The flow of people into Paramaribo has not yet resulted in major urban epidemics of diseases with traditionally high prevalence or incidence rates in the interior, such as malaria, typhoid fever, viral hepatitis, tuberculosis, leprosy, and leishmaniasis. Fortunately, efficient vectors for malaria and leishmaniasis do not exist in the coastal area.

Among the major effects of the war on morbidity and mortality have been the uncontrolled increase of malaria transmission in the interior, a rise of violence as a major cause of death and injury, and an increase in malnutrition levels. Unfortunately, no precise data have been available on morbidity and mortality in the interior since 1986. Over the years, the medical mission has been compiling demographic and epidemiologic data showing relatively high mortality rates, high birth rates, high morbidity (for malaria, typhoid fever, viral hepatitis, tuberculosis, leprosy, and leishmaniasis), high rates of illiteracy, and high rates of malnutrition.

Vector-borne diseases. There were no reports of dengue cases in 1985. In 1986 an epidemic of dengue type

II caused more than 300 reports of suspected cases. Of 146 sera taken, 52 were found to be positive for dengue type II, while in 26 cases, influenza A was found. Two cases of dengue shock syndrome were reported. Since 1986, dengue type II has been endemic in Suriname; before 1986, dengue type I and dengue type IV had been isolated. In 1988 there were eight confirmed dengue cases; seven were positive for dengue by HAI-test and in one case dengue type I was isolated. This last finding suggests that in 1988 it was probably dengue types I and II that were circulating.

The last case of urban yellow fever occurred in January 1909. Since then, four cases of jungle yellow fever have been reported—one in 1968, one in 1969, one in 1972, and one suspected case in 1984 which was never confirmed.

The malaria eradication program has been in operation since December 1957. In 1972, chloroquine resistant *P. falciparum* was detected for the first time during an epidemic among Amerindians near the border with Brazil. In 1980, the total number of cases (4,445) was the highest since the eradication campaign began.

Malaria is endemic mainly in the deep interior of the country, while the coastal area, including the city of Paramaribo, is free of the disease. Transmission occurs throughout the year. Most cases are caused by *P. falciparum* (80%), followed by *P. vivax* (15%). *P. falciparum*'s increasing resistance to chloroquine and fansidar, and guerilla activities in the interior that have resulted in poor access to that area led to the deterioration of the malaria situation in 1987 and 1988. A national Malaria Crash Program, implemented in 1988 and continuing in 1989, was approved by the Ministry of Health.

Schistosomiasis transmission is restricted to certain areas in the coastal zone, mainly in the district of Sarawacca. In 1973–1974, at the beginning of the antibilharzial campaign, the prevalence of schistosomiasis was 44.2% in the area of Tijgerkreek and 26.2% in the area of Calcutta. In five years the control program succeeded in bringing down prevalence rates to about 8%; currently, the prevalence rate is about 3%.

Filariasis bancrofti is considered to be of public health importance; however, there is evidence that the disease is disappearing in Suriname, since the last indigenous case was reported in 1980. The rate was 17.4% in 1950, 9.0% in 1960, 2.1% in 1970, and it had dropped to below 1% in 1980. A closed sewerage system in the city has diminished the mosquito vector's population. The question has been raised whether imported filariasis cases from Guyana will generate transmission in Suriname, but up to now there is no evidence of this.

Leishmaniasis is seen throughout the country but is mainly contracted in the bush. Cutaneous leishmaniasis is prevalent and the mucocutaneous form is sometimes

seen; so far, visceral leishmaniasis has not been reported in Suriname. In 1979–1984 the annual incidence of reported leishmaniasis was 6.6 per 10,000 population; the male/female ratio is 5 to 1.

During 1982–1984, 78 patients with suspected leptospirosis were hospitalized and reported; 54 were confirmed by laboratory investigations. During 1985–1988, 95 patients with suspected leptospirosis were hospitalized and reported and 50 were confirmed by laboratory investigations. In 1987, 14 (88%) of the 16 confirmed leptospirosis cases were men.

Other communicable diseases. In 1987, 101 suspected hepatitis cases were reported by medical specialists. After investigation, 49 cases were determined as hepatitis B and 16 as leptospirosis. There were four reported outbreaks of hepatitis A in 1985–1988; one occurred among schoolchildren in 1985.

The rate of detected leprosy per 10,000 population has declined from 5.8 in 1981 to 1.2 in 1987. During this period, between 79% and 94% of the cases were of the paucibacillary type. The numbers of multibacillary cases of leprosy have not declined as much. The proportional distribution of leprosy cases by ethnic group in 1987 was: Creoles 48.8%, Bushnegroes 25.6%, East Indians 14.0%, Indonesians 7.0%, and others 4.6%.

The incidence of detected cases of tuberculosis in 1987 was 19.0 per 100,000 population; rates remained unchanged in 1983–1987.

During 1980–1984, 167 patients were admitted to four hospitals in Paramaribo because of meningitis and/or encephalitis; 75 cases were diagnosed as encephalitis, 37 cases as bacterial meningitis, and 59 cases as nonbacterial or unspecified meningitis.

Noncommunicable diseases. In 1986, 562 patients with intoxications were seen at the emergency department of the Academic Hospital; 105 were hospitalized and 30 (29%) died, most of these (24) from paraquat intoxication. Most intoxications occurred in the 0–4-year age group (30.4%) and in the 15–29-year age group (37.0%). In the 0–4-year age group most intoxications were caused by household chemicals (mostly household bleach and cleaning solutions, petroleum, medications, and rat poison). In the 15–29-year age group acetic acid and paraquat were most frequently involved.

Of the 105 hospitalized intoxication cases in 1986, 54% were attempted suicides, 45% were accidental, and two cases were attempted homicides. In 1987, 525 non-hospitalized cases from the same facility were studied: 55% were accidental, 43% were attempted suicides, 1% (six) were attempted homicides, and four were due to unknown causes.

According to police reports, fatal traffic accidents have

declined from 89 in 1985 to 57 in 1988. The police also have reported declining numbers of detected traffic accidents in Paramaribo: from 2,519 in 1985 to 1,836 in 1988. The reasons for these trends are unknown, and many traffic accidents are not detected by the police because the involved parties settle things among themselves. Also, there could be fewer vehicles on the road because of the lack of spare parts—the number of registered motor vehicles declined from 80,441 in 1984 to 77,733 in 1988 and, more dramatically, registered mopeds decreased from 35,808 in 1984 to 28,346 in 1988.

Two percent of persons involved in traffic accidents were seriously injured: most (44%) were moped drivers, followed by pedestrians (31%). Most patients hospitalized because of traffic accidents were victims of accidents between mopeds and other motor vehicles and between pedestrians and motor vehicles.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

The country's health sector benefits from the active participation of many organizations and foundations. Apart from the Ministry of Health, many semi-public foundations, which are technically under the Ministry of Health and are financed by public money, participate in the sector's activities; these organizations enjoy greater autonomy with respect to government regulations. Private hospitals are also eligible for government subsidies under certain circumstances. Three public sector agencies are involved in financing the sector's activities: the State Health Insurance Foundation (SZF), the Ministry of Social Affairs, and the Ministry of Finance. Nursing and medical schools and professional associations also play significant roles.

Health services are provided through hospitals, health clinics, and health posts. The public health sector delivers about 25%–28% of all care. Within the public sector there are government-owned and operated hospitals which have semi-autonomous status, with the Minister of Health serving as chairperson of the Hospital Boards.

Health care in the interior is delivered by the medical mission ("Medische Zending"), a private, multidominational organization. All services are free, both at the primary care level and at specialized levels of medical care. The Diakonessen Hospital in Paramaribo coordinates and

supervises all medical mission activities and serves as a reference hospital and training center.

Primary health care is provided basically through the Regional Health Service (RGD) along the coastal plain and through the Bureau of Public Health. The medical missions deliver primary health care in the interior. The RGD delivers peripheral services through its health centers, basic clinics, and dispensaries. Health clinics are the main administrative facility and operate on a 24-hour basis. Basic clinics (or medical aid posts) cover remote areas with populations ranging between 250 and 2,500. A mobile team comprised of a physician, nurse, administrative assistant, and midwife makes visits to clinics once or twice per week.

Great success has been achieved through the transfer of disease control activities from vertical programs to primary health care services: malaria control operations were more efficient at half the previous expenditures, malaria transmission in important foci was interrupted, and vaccination efforts increased coverage from less than 30% to over 80% in two years. The hospital infrastructure was also strengthened in several areas, although construction projects were halted following cancellation of development aid from the Netherlands.

Drug production and distribution was reorganized as an independent state drug supply company, and several attempts were made to introduce a comprehensive national formulary. Attempts to improve management and information systems at all levels of health services have not succeeded.

The 1988 national health plan reiterates the Government's commitment to primary health care, declares that health is an essential component of general development goals, and stresses prevention activities. Protective measures include intensified environmental control; nutrition promotion including quality control of food; and care of high risk groups such as mothers and children, the disabled, and the elderly.

Given the political and administrative structure of the country and the fact that service organizations traditionally have served the community, there is real intersectoral action and social participation in health.

The regional health service responsible for primary health care in the coastal regions is in the process of finalizing its technical, administrative, and financial decentralization.

The health infrastructure in the interior has either been totally destroyed or severely damaged in many areas. The infrastructure of the entire health sector has suffered noticeable deterioration, and large capital investments are required to restore it. Since prospects for immediate economic growth or recovery are not good, the health sector will have to continue to brace itself for hard times to come.

Production of Services

About 93% of the people have access to a polyclinic within a 5-km radius of their homes and with a maximum bus fare of 50 cents. The SZF currently covers all expenses for curative medical care, hospital and laboratory services, drugs (except for a token charge per prescription), and a portion of the cost for eyeglasses for all state employees and their dependents and for retirees. This covers 33% of the national population. The Ministry of Social Affairs covers another 22% of the population designated as poor or near poor. The medical missions, through the Ministry of Health, provide curative and preventive primary health care services in the interior. All told, including private companies, an estimated 82% to 91% of the population receives mandatory coverage.

Along the coastal plain the population is served by clinics and polyclinics with physicians and nurses, and these clinics refer patients to higher levels of care. In the interior there are clinics staffed by a physician and a nurse and health posts staffed by a health worker with clearly defined and delimited roles and responsibilities. A network of radio communications provides a ready exchange of information so that emergency medical/professional help can be directed to a given area on short notice. In extreme cases, a patient can be transferred from one of the many small airstrips to tertiary care in Paramaribo. However, the political unrest in the interior has seriously hampered communications.

Although the health care system is organized to provide readily available and accessible health care, there are no aggregate national data on actual use, length of hospital stay, etc., although there is information on individual hospitals.

Installed Capacity

Suriname's clinical facilities, shown in Table 2, are mainly organized by the Ministry of Health or by the medical missions; the latter are also supported by the Ministry. Other governmental and private organizations support additional hospitals.

Each category is administered by physicians and nurses; the country does not depend on community health workers. Referrals are made by a physician at any one level to a facility at a higher level.

The country has approximately 5.1 beds per 1,000 population; the ratio of general acute care beds per 1,000 population is 4.1.

Health Services Technologies

A local Government-owned company produces a limited number of drugs (80 to 90 items). There is also a

TABLE 2
Number of health facilities and beds, by ownership, Suriname, 1989.

| Facility/ ownership | Ministry of Health | | Missions | | Other (private) | | Total | |
|------------------------|-----------------------|------|----------|------|-----------------|-------|-------|-------|
| | No. | Beds | No. | Beds | No. | Beds | No. | Beds |
| Hospitals | 3 | 884 | — | — | 6 | 1,117 | 9 | 2,001 |
| Health centers | 3 | 38 | 9 | 116 | — | — | 12 | 154 |
| Clinics | 32 | — | — | — | — | — | 32 | — |
| Dispensaries | 49 | — | 42 | — | — | — | 91 | — |

national drug formulary with a list of 600 essential drugs. Laboratory services are adequate to meet the population's needs, but much of the laboratory equipment requires upgrading. The Regional Health Service is currently considering establishing a regional laboratory to locally conduct most of the routine tests which now are being done in Paramaribo. A recent agreement between Brazil and Suriname will enable Brazilian laboratories to offer limited specialized testing for various diseases. There is also a PAHO-funded, fully equipped AIDS testing laboratory, and the capability to perform confirmatory tests also exists within the blood transfusion services. Paramaribo has an adequate blood bank which provides blood for the entire country. A recently enacted Ministry of Health policy requires that all blood be tested for antibodies to HIV before transfusion.

The country has basic radiology services, but much of the equipment needs to be maintained or replaced. Radiotherapeutic services are almost nonexistent, and many patients must be referred overseas for these services at a very high cost.

Dental care services are adequate. Schoolchildren aged 4–16 are covered for preventive and curative dental services. Some companies cover dental care services for employees and their dependents. Civil servants are also entitled to dental services under a 1982 agreement between the labor unions and the Ministry of Home Affairs.

Financing of the Health Services

Health care financing originates from three sources. The first is employee and government contributions to the State Health Insurance Foundation, which then reimburses civil servants and their dependents for health care. The Foundation, which began in 1981, covers curative services for 33.4% of the population; on 31 January 1989, coverage was extended to all Surinamers not already covered by an existing payment mechanism.

The second source is Ministry of Finance funds allocated to the Ministry of Health for its various services

and to the Ministry of Social Affairs for payment of health care services for the poor and near poor.

The third source is private companies, which are legally required to pay for health services provided to their personnel and their families (including hospital care, drugs, and medical care).

The recurrent health expenditure of both public and private sectors is about Sur.f.116 million or 7.5% of the GDP and 10.7% of the Government's recurrent expenditures. Some believe the former percentage is an underestimate, as it does not take into account the capital expenditure of the private sector or the private health expenditure incurred outside hospitals by individuals or companies.

Capital investment in the health sector over the last several years has been practically nonexistent. As a result, almost all hospitals, health centers, and supporting institutions need to be upgraded and/or expanded. In addition, equipment, instrumentation, and production material are in dire need of replacement.

Health Planning and Administration

Historically, the planning and managerial capacity within the public health sector has been a problem. However, a draft national health plan which incorporates ten priority areas was developed in March 1988. In order to implement these national priorities, several seminars were held with Regional Health Service program managers to review and upgrade policies. The vital register of births and deaths was reviewed and upgraded for the first time in more than 20 years, and major strides have been taken in the development of a community-based health information system with a clearly defined feedback mechanism. A study is currently under way on the institutional strengthening of the Academic Hospital, and for the first time in more than a decade a major organization and management study of the Bureau of Public Health is being undertaken. The management information system

of the Regional Health Service is thorough and very functional.

Human Resources

Data on human resources in Suriname are scanty. In 1987, the ratios of human resources in health per 100,000 population were: 8.4 for physicians, 5.0 for dentists, 20.8 for nurses, and 16.7 for nursing auxiliaries. The ratios are decreasing due to a consistent drain of skilled personnel. There are five veterinarians in the country.

HEALTH AND THE ENVIRONMENT

Paramaribo, Nieuw Nickerie, and some other areas have traditionally been served with a good water supply; over the past few years a program of improvement of the water supply in the rural area had been undertaken. The ongoing unrest in the interior has severely limited this program, and the lack of foreign exchange to purchase spare parts and new equipment also is a significant problem. All public water supplies are from groundwater, and the major concern regarding groundwater contamination is saline intrusion in the coastal area.

The common method of sewage disposal is by septic tank and "oxidation" bed, with discharge into drainage ditches or canals. Excreta disposal is by pit or barrel latrine. Many villages in the interior have no organized system of excreta disposal, while in many urban areas pit latrines are routinely flooded during the two annual rainy seasons.

Responsibility for environmental health matters in Suriname is scattered among several ministries and government agencies. All the government agencies working in the environmental health sector operate under very old laws which are largely inadequate to deal with current concerns.

Potentially the most significant recent development was the establishment, effective 1 January 1989, of the Environmental Control Division (MCA) of the Bureau of Public Health. This division, made up of the pre-existing Sanitary Inspectorate and the new Environmental Technical Service, will serve as the standard-setting agency for environmental health and will monitor and control environmental quality. The MCA will also serve as the focal point for environmental health matters, and will closely coordinate its work with that of all the agencies involved. The division's current program calls for execution of a detailed situation analysis to determine which areas require priority attention.

TRINIDAD AND TOBAGO

GENERAL CONTEXT

Political, Economic, and Social Situation

In 1962, Trinidad and Tobago gained full independence within the British Commonwealth, from which it withdrew in 1976 to become a Republic. The Constitution provides for a 31-member Senate appointed by the President and for a 36-member House of Representatives. In 1986, the opposition party won a landslide victory over the party which had been in power since 1956.

From 1986 to 1988, public policy was guided by the ruling party's manifesto, which emphasized industrial sector privatization. In July 1988, the new Government published a major policy document, the "Macro Economic Framework for National Reconstruction, 1989-1995," which sets priorities for restructuring the society and reconstructing its socioeconomic growth.

The framework's four developmental phases are restructuring, stabilization, implementation, and investment. The priority sectors in the investment phase are manufacturing, energy, agriculture, and tourism. Strategies of divestment of state enterprises, privatization, decentralization, control of recurrent expenditure according to available resources, and debt rescheduling are expected to provide the needed boost to investment and economic growth.

Throughout 1985-1988, the country's economy continued the steady decline begun in 1982. The real gross domestic product (GDP) declined every year since 1983, registering a negative trend over four consecutive years.

The drop in oil prices and production resulted in a substantial decline in oil revenues, which were the major source of foreign exchange, and balance of payment deficits could no longer be sustained by the substantial foreign reserves accumulated during the boom years. By 1988, reserves were completely exhausted and, despite strict import licensing and foreign exchange control, the fourth quarter of that year registered negative balances. The government budgets for 1987 and 1988 included corrective austerity measures, and 1987 witnessed an overall balance of payment improvement. However, per-

sistent foreign exchange problems and an increased debt servicing led to further devaluations of the Trinidad dollar by 18% in August 1988 (after a 33% devaluation in 1985), with a parity of \$TT4.25 to \$US1.

The agricultural sector, which benefited from the contraction of employment opportunities in the economy at large, offered a bright spot in the gloomy quadrennium's economy, as displaced workers turned to agriculture as an alternative source of livelihood. Both domestic and export agriculture grew strongly, especially the production of food crops for the domestic market. Export agriculture had a 26% increase in the latter part of 1987, up from 1984 levels. However, the country has yet to tap agriculture's true potential contribution to national development. In the 1960s the country was a net exporter of food, but now relies on imports for about 75% of its requirements.

Despite declines in total revenues, successive governments have found it difficult to reduce recurrent expenditures and have resorted to domestic and foreign borrowing to finance the resultant deficit. As a result of these practices, at the end of fiscal year 1986, 72% of total public sector debt consisted of external commitments. In the 1989 original estimates of expenditure, 26% of total recurrent expenditure was budgeted for debt service, up from 3.9% in 1982.

Employment trends have declined with the economy. The rate of unemployment, which stood at 9.9% in 1982, was 23% in 1988, and was projected to be 25% in 1989. The groups most affected were youths (15-24) and young adults (25-29), who at the start of the period represented 35% and 23% of the unemployed, respectively, and by the end of 1988 reached levels of 49% and 36%, respectively. Both males and females have been affected, but young females aged 20-24 represented a significantly growing proportion of unemployed.

The precipitous drop in the price of petroleum has had a domino effect, sending the economy into negative growth and, in turn, depressing revenues available to the Government for sector programs: all sectors, health included, suffered a drop in their usual share of the Government's expenditures.

Education is free at primary and secondary levels. By the end of 1985-1988, primary school enrollment was

96% and secondary school attendance rose from 36% in the mid-1960s to 61% in the early 1980s. The adult literacy rate was 97.2%.

Estimates of the availability of food indicate an average of 2,637 Kcal and 77 g of protein per person per day in 1985. Only 23% of the energy and 17% of the protein available were from domestic food production (a decrease from 50% and 26%, respectively, in 1970). Despite the increase in domestic food production since 1985, local foodstuffs have not been able to compete with imports due to restricted availability and high costs of agricultural inputs (land, labor, seeds, fertilizer, pesticides, agricultural machinery and equipment, etc.), adverse marketing and trade arrangements, and high postharvest losses, among other factors. Traditional export crops are cocoa, coffee, and sugar, whose production has fluctuated from 1984 to 1987.

The Government's social security schemes cover retirement, maternity, sickness, death, and industrial injury. In 1985, new legislation made redundancy payment to employees the first obligation for a company going into liquidation.

Demographic Characteristics

The most recent official data presented here are from 1984 and from a 1987 demographic health survey. The estimated 1986 mid-year population was 1.2 million, having risen from 1.1 million in 1982. The annual growth rate has fluctuated over the last two census periods, from 1.2% in 1970 to 1.5% in 1980. Factors influencing growth include a drop in the crude birth rate, from 29.2 per 1,000 population in 1982 to an estimated 27 per 1,000 in mid-1986; the crude death rate, which remained almost constant over the same period; and the high out-migration, which, according to Central Statistics Office figures, reduced by one-third the impact of excess births over deaths.

Over the last three decades, the population in the under 15 age group has shown a clear decline, from 42.9% in 1960 to 33.6% in the 1970s, and much less sharply to 33.2% in the 1980s; trends have affected males and females equally. The relative stability of the 65 and over population (between 5.6% and 5.7%) implies that there has been an increase in the 15–64-year-old population, with a concomitant decline in the dependency ratio and a strong injection of youths and young adults into the labor market. This, however, has coincided with a marked decline in employment. The participation rate in labor, which had increased to 61.5% in 1984, had fallen to 59% by 1986. Trends have been relatively uniform among males and females.

The 1.3 million estimated 1990 population is expected to grow by 21.8% to 1.6 million by the year 2000, with an increase of two years in life expectancy within this decade. The under 15 age group is forecast to experience only a slight further decline, with a concomitant low increase of about 1% or more in the 15–64-year-old population. The population 65 years and over will remain stable or even decline.

Priority groups for national development are children, women, youths, the elderly, and the disabled. In 1960, 16.6% of the population was aged 5 and under. Females of childbearing age (15–44 years) accounted for 41% of the population in 1970 and 47.3% in 1980. The 1987 demographic health survey showed that 44.4% of women aged 15–49 lived in urban areas. More than 92% of the sample had completed at least five years of primary education and 54% had had some secondary schooling.

The survey also found that the age-period fertility rate is rather low for teens (84 births per 1,000 women), more than doubles for women in their twenties, and then falls sharply for women aged 35 and above. The total fertility rate, which summarizes the age-specific fertility rates for women aged 15–49, has declined from 3.4 children per woman in 1972–1976 to 3.1 a decade later. Age at first birth has risen steadily from 20.5 years to 22.2, indicating contraceptive effectiveness.

Total fertility rates are higher in rural areas and decrease in women living in more urban areas and who have more education. Women with primary education had an average total fertility rate of 4 children as compared to 2.3 children among women who had completed secondary or university education. Increasingly, young females aged 15–29 become mothers at younger ages, and this also is the group with high unemployment levels.

In 1980 it was estimated that some 60% of the population lived in predominantly urban centers, and it was forecast that by the year 2000 this figure would rise to 70%. A 1984 national physical development plan promoted a more equitable distribution of both population and economic activity through a strategy of "dispersed concentration," which deemphasized the major urban centers and promoted increases in the suburban population. Two major factors contributing to the continuing urbanization trend will be an increase in non-agricultural jobs and a continued improvement in the transportation system, thus facilitating migration from rural to urban areas.

At the end of 1988 it was estimated that 18% of the population was living in poverty. The extent to which poverty has affected nutritional status in children has not yet been assessed, but based on hospital admissions it is recognized that the incidence of severe malnutrition has increased in 1985–1988.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

Current data are lacking and, while available mortality data are fairly complete, reliable and accurate morbidity data are sparse and incomplete.

Crude death rates have decreased markedly, from 18.9 per 1,000 population in 1930, to 6.9 in 1980, and 6.7 in 1984; the final decade of this period was characterized by a flattening tendency. Examination of age-specific mortality shows that there was a significant drop in death rates for the under 5 age group, from 8.4 in 1967 to 5.7 in 1977; mortality in the 25–34-year age group, on the other hand, was 5.9% greater in 1977 than in 1967. In 1981–1984, death rates continued to rise for the 15–39-year age group. Mortality in young males is 33% higher than in females and bears the weight of the increasing trend in that age group.

Central Statistical Office data indicate that declines in the crude death rate are matched by favorable trends in infant mortality, with decreases from 21.7 deaths per 1,000 live births in 1980 to 13.7 in 1984. However, this optimistic outlook is not borne out by the 1987 demographic health survey data, which gave a figure of 26.2 deaths per 1,000 live births. Neonatal death rates represent 66% of all infant deaths (1984), and the trend is towards an increase—from 8.1 per 1,000 live births (1979) to 9.1 per 1,000 live births in 1984.

Mortality in young adults, particularly in males, is projected to rise in 1980–1990 due to increases in the incidence of AIDS, accidents, drug abuse, and other social and lifestyle conditions affecting that group. Available disaggregated data show that while deaths among young females have continued to decline, those among young males have remained comparatively constant. The decline in the female population mortality has only slightly affected women 55 years and older, who constitute 28% of the female population.

These favorable mortality trends are reflected in an increase of life expectancy at birth. For males, life expectancy increased 4.8 years, from 62.1 in 1960 to 66.9 in 1980; for females it increased 5.3 years, from 66.3 in 1960 to 71.6 in 1980.

Since 1977, the five leading causes of death have been heart diseases, cerebrovascular disease, malignant neoplasms, diabetes mellitus, and accidents. These five causes accounted for 57.9% of all deaths in 1971, 60.8% in 1977, and 66.7% in 1983.

Cardiovascular disease death rates have increased over the last two decades. The risk of death from diabetes mellitus has increased progressively between 1960 and

1984. Neoplasms have been the third ranking cause of death for years: prostate, stomach, and lung are the most frequent sites in men and breast, cervix, and uterus, followed by stomach, the most frequent sites in women.

Accidents have ranked as the fifth major cause of death since 1971, with death due to motor vehicle accidents contributing to 42% of accidental deaths in 1959–1961 and 48% in 1979–1981. The risk of accidental death in males (53 per 1,000) was 3.5 times the risk in females (15 per 1,000) in 1959–1961; in 1979–1981 it was 57 per 1,000 for males and 17 per 1,000 for females.

In the mid-1960s death rates from suicide, due mainly to chemical ingestion, were among the highest in the Western Hemisphere. Despite a decreasing trend, these remain high, and hospital admissions remain high as well. During 1983–1987, females accounted for 62% of the 4,410 admissions from chemical ingestion to the Port of Spain, San Fernando, and Sangre Grande Hospitals; males accounted for 65% of the 495 deaths due to chemical exposure.

Health Situation of Specific Population Groups

Child Health

According to the 1987 demographic health survey, infant mortality has fallen steadily to the present level of 26.2 per 1,000 live births. However, deaths in the neonatal period have decreased more slowly. Major constraints to analysis of the trend are the lack of up-to-date data and the underreporting of deaths in early infancy. Partial surveys indicate that many early neonatal deaths are reported as stillbirths. Childhood morbidity data are unavailable. In 1983 the leading causes of death in children under 1 year, in descending order, were conditions originating in the perinatal period, congenital anomalies, and influenza and pneumonia. Diarrheal diseases, which in 1979 ranked second with 548.0 deaths per 100,000 live births, dropped to fourth place in 1983 with 78.3 deaths per 100,000.

Enteritis and other diarrheal diseases are an important cause of death among children aged 1–4, as are accidents. With the expected reduction in deaths from diarrheal diseases, the significance of accidental death at this age will be considerably magnified. Morbidity trends in childhood diseases preventable by vaccination showed a decrease over 1968–1986; these diseases have declined as serious health problems for this population group. These trends should continue if immunization coverage is maintained at 1987 levels (79% for DPT and 80% for polio among children under 1). However, mumps has shown a tendency to increase, from 91.6 per 100,000 population in 1987 to 212.2 in 1988.

Foodborne illnesses have increased over the last five years, with gastroenteritis as the major cause of morbidity among children under 5 years. Reported cases of gastroenteritis in children under 5 increased from 14,750 in 1983 to 24,632 in 1984, then declined to 23,408 in 1987 and 23,335 in 1988. A malnourished child is also more susceptible to gastroenteritis and other infectious diseases.

Accidents caused 46.8% of mortality from defined causes in the 5–14-year age group in 1983. Malignant neoplasms ranked second (8.3%), diseases of the heart ranked third (6.4%), with bronchitis, emphysema and asthma, and influenza and pneumonia tied for fourth (3.7% each).

Health of Adolescents and Adults

In the 15–24-year age group, mortality has not decreased significantly. The leading causes of death in 1983 were accidents (with 43.7% of the 268 deaths from defined causes), suicide (11.9%), homicide (6.0%), influenza and pneumonia (5.2%), and malignant neoplasms (4.5%). Mortality data, however, do not give a full picture because of the generally low death rates due to natural causes. Data showing the prevalence of drug abuse, including alcoholism, are not available.

The principal cause of death in women in the 15–44-year age group in 1977 was malignant neoplasms, with cancer of the breast, cervix, and uterus being the main contributors. Maternal mortality remains fairly high: initial declines in the 1950s–1960s (from 5.4 per 1,000 live births to 1.3) did not continue, and the figure was 1.9 per 1,000 in 1969, but fell to 0.8 in 1987. At least 46% of the discharges from abortions in the Port of Spain and San Fernando General hospitals were in the 15–24-year age group.

Risk factors for pregnancy complications include age and parity. Assuming that births to women under age 20 and over age 35 and that all births of order of 5 and above are high risk, in 1983 there were 14,131 high risk births, or 42.6% of the 33,208 births. If high risk births are defined as only those of parity 5 and over regardless of age, then there were 4,584 births of high risk, or 13.8%. Place of delivery and the category of attendant at birth are also important risk factors. In 1983, 85.8% of the births took place in government hospitals and 90% of births were attended by doctors or midwives.

In the 25–44-year age group, the leading causes of death in 1983 were accidents (19.8% of the 734 deaths from defined causes), heart disease (15.3%), malignant neoplasms (8.3%), suicide (6.5%), and cerebrovascular disease (5.6%). The death rate for accidents was much higher among men (73.9 per 100,000) than among women (17.6).

Health of the Elderly

In 1983 the five leading causes of death in this age group were diseases of the heart (34.3% of the 1,309 deaths from defined causes), cerebrovascular disease (17.4%), malignant neoplasms (12.1%), diabetes mellitus (10.3%), and influenza and pneumonia (3.8%).

A 1985–1986 survey of the elderly found that the main health problems were cardiovascular disease; arthritis; and disabilities in locomotion, eyesight, and, to a lesser extent, hearing. Except for dental services, the majority of this population relied on public health institutions and health clinics, but expressed difficulty in getting timely services and appropriate treatment. The group as a whole, whether employed or unemployed, felt that their basic needs were not being met, especially those persons in the lower income brackets. The elderly in general were not satisfied that their nutrition needs were met. The perception of this age group shows relatively good health status.

Problems Affecting the General Population

Protein-energy malnutrition (PEM) has been identified as one of the main nutrition-related problems: available clinic data for 1987 show that 5% of preschool children had a weight for age below 80% of the expected value. There are, however, wide variations (from 2.8% to 36.4%) according to age group and location. The 1987 demographic health survey showed a higher prevalence of PEM among girls than among boys younger than 36 months of age (7.6% vs. 6.2%). Prevalence of acute malnutrition judged by weight for height is lower and closer between both sexes: 3.9% in girls and 3.8% in boys. However, severe malnutrition is reappearing in the pediatric world, having been linked to the deterioration of the economic status of the population in general and the low income groups in particular. At the other end of the scale, 50% of the women and 19% of the men aged 15 to 64 years are obese. Iron-deficiency anemia is another major public health concern, particularly among pregnant and lactating women and among children—56% of the former and 29.4% of 5–13-year-old children were found to be anemic in 1987.

Alcoholism is one of the major factors contributing to hospital admissions.

Yellow fever and dengue are endemic in the country. The last human cases of yellow fever were reported in January 1979; yet, despite the fact that yellow fever has not appeared either in its epizootic form or as an urban epidemic, the virus was isolated from batches of forest mosquitoes (*Haemagogus janthinomys*) as late as January 1988. There were 5 cases of dengue fever in 1985, 78 in 1986, 136 in 1987, and 31 in 1988. The vector for both

viruses, the *Aedes aegypti* mosquito, exists in large numbers, despite efforts to reduce their numbers through an eradication program. The overall *Aedes aegypti* house infestation index was 8% (1988). With the introduction of *Aedes albopictus* in the Region, an effective vigilance service has been implemented and maintained in the country.

Trinidad and Tobago was declared free of malaria in 1965, and only imported cases have been reported so far since the eradication of this disease in the 1950s (7 in 1988). The increase in the number of imported cases has leveled off over the last few years. The wide distribution of the vectors *Anopheles aquasalis* and *A. bellator* is a constant reminder that the threat of a malaria epidemic still exists.

The first cases of AIDS were detected in 1983. By the end of 1988, 380 AIDS cases and 233 deaths (61%) had been recorded. The increase in the heterosexual population is a distinctive feature, with the male to female ratio going from 4 to 1 in 1984 to almost 1 to 1 by the end of 1988. The AIDS mortality rate has increased from 0.53% per 100,000 population to 7.8% between 1983 and 1988.

AIDS cases are treated as inpatients in all the hospitals; no efforts have been made to provide specialized wards for them. Two clinics in Port of Spain and one in San Fernando provide treatment and counseling services for patients and their contacts. However, this service is deficient due to a lack of adequately trained counselors, psychiatrists, and social workers. Laboratory and blood bank screening facilities are being strengthened. A comprehensive national AIDS program, with a full-time coordinator, has been established, and an intersectoral national coordinating committee has been formed. A five-strategy medium term plan has been developed and funded, mainly by external resources.

Trends in other significant communicable diseases are increases in viral hepatitis A and B. This might reflect greater laboratory diagnostic capacity. Annual data suggest there has been considerable prenatal transmission over the last quadrennium. Scabies, a relatively controllable disease and an index of poor sanitation and hygiene, has increased in all counties including Tobago; rates increased from 576.8 per 100,000 population (1987) to 683.1 (1988). Partial investigations have shown a concomitant rise in acute glomerulonephritis in the San Fernando area. Rates of Hansen's disease have remained unchanged, and a slight decrease has been registered in tuberculosis rates.

The incidence of gonorrhea dropped from 488 per 100,000 in 1976 to 213 in 1984, and rose again to 310 in 1985. In 1973–1985, the incidence of infectious syphilis fluctuated from a high of 80 per 100,000 in 1977 to a low of 29 per 100,000 in 1984, and increased again

to 41 per 100,000 in 1985. It is likely that the appearance of AIDS and the general downturn in the economy have influenced more persons to seek attention at the government clinics.

DEVELOPMENT OF HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

The country's health care system, traditionally of a public assistance type, is under transition toward a mixed model that includes privatization, national health insurance, and regionalization based on decentralization. To date, however, most health care is provided by the Government through the Ministry of Health.

Responsibility for health rests with the Minister, who, in turn, is directly responsible to the Cabinet. The Permanent Secretary, a public servant, is responsible for the overall administrative and financial management of the Ministry. The Chief Medical Officer is responsible for all technical aspects of the health programs.

The Government is committed to a policy of decentralization as a way to achieve greater efficiency, particularly in supplies management and in financial and cost accounting. In accordance with this policy, non-public, specialist service institutions such as the Solid Waste Management Company (1980) and the Hospital Management Company (1981) were established. The latter was slated to end operations in early 1989, with most of its portfolios reverting to the Ministry of Health.

The public health services are based on a three-tiered system which consists of primary, secondary, and tertiary levels of care. Primary care services are administered by the Principal Medical Officer (community services). These services are administratively divided into nine counties, each under the control of a county medical officer of health who supervises a team of medical officers, public health nurses, public health inspectors, pharmacists, social workers, nutritionists, dental officers, nurses, and health educators. The Principal Medical Officer (institutions) is responsible for medical and ancillary services within the major hospitals. The smaller district hospitals are, however, administered within the community health services.

Throughout 1985–1988, the country has had no single clear-cut documented health policy, but several government documents have established specific policy orientations for health and health-related matters. The most recent of these, the "Macro Economic Framework for National Reconstruction, 1989–1995," contains policies,

strategies, and proposed programs for the development of all sectors, including health.

The major policy objectives for the health sector during the period covered in the Framework may be summarized as follows: to make quality health care available to the population at affordable costs; to promote the importance of healthy lifestyles and habits among the population; to ensure ready accessibility to basic health services by all sections of the population; to promote and maintain a dynamic preventive health care program; to reduce the incidence of environmental health problems; and to promote a high standard of industrial health and safety.

As a matter of broad strategy, a primary health care approach is envisioned as the route to best achieve the stated objectives. To this end, the present Government has proposed the following specific strategies in primary health care in the Framework: direct more resources into primary health care; commit resources to health education activities; shift from the present overly centralized administrative structure to a more decentralized mode, with activities such as the day-to-day personnel functions, community health education, and environmental health monitoring being removed to the periphery; focus on mothers and children, hypertensives, diabetics, and the elderly as high risk groups; formulate a national nutrition plan; redesign the oral health program; and initiate multidisciplinary research.

Programs to educate the population regarding the prevention/avoidance of substance abuse will be promoted.

All of the policies, programs, objectives, and strategies stress the role of informed community participation in the diagnosis of the health situation, as well as in the planning, implementation, and evaluation of programs. A "ground-up" approach is envisioned in which traditional organizations in the community will be used to awaken community interest and motivate participation.

Installed Capacity

At the primary level there are 102 health centers strategically located throughout the country, yielding a ratio of approximately one health center per 11,000 population. Centers differ in both the scope and depth of services provided, depending on the size of the communities served and on the available manpower. The effectiveness of this extensive network run by community health teams has been limited by managerial deficiencies, ineffective logistics, inadequate manpower resources or inappropriate skill mix, lack of ancillary services, poor facilities maintenance, ineffective workload scheduling and manpower development, weak information systems, and inconvenient operating hours. All primary health care is free.

Specialist services are provided by visiting specialists at the health centers, and it is at this level that the major immunization programs are conducted. Home and school visits are conducted by specially trained public health nurses. The health education division provides educational services in the community and schools with the aid and support of the county health teams.

Secondary and tertiary levels of care are provided by public hospitals and delivery units with a total of 4,613 beds, 35% of which are located in the two major general hospitals in Port of Spain and San Fernando. In addition, eight smaller district and county hospitals provide secondary care and some primary care. Referrals are made from the simpler to the more sophisticated.

Specialized and long-term care are provided by Mt. Hope Maternity Hospital, St. Ann's Psychiatric Hospital, Caura Hospital (cardiothoracic care and pathology), and St. James Medical Complex (geriatric services, oncology, and physiotherapy). Together, these specialist hospitals contain 2,308 beds (1980).

Other health facilities include outpatient services for sexually transmitted diseases, chest clinic outpatient services, the health education unit, the leprosy control unit outpatient services, and the insect vector control division. Laboratory facilities are found at general, specialist, and county hospitals.

The teaching hospital at the Eric Williams Medical Sciences Complex, which was commissioned in 1989, would provide an additional 550 beds for medical, surgical, pediatric, and psychiatric services. This hospital will serve primarily as the national referral tertiary hospital. Responsibility for the Complex has been decentralized to an autonomous national authority.

The hospital/bed population data for 1985 show a ratio of 4.5 beds per 1,000 population for all beds (including those privately owned); 3.96 per 1,000 for government-owned beds; and 1.8 per 1,000 for government short-stay beds, of which the ratio in North Trinidad is 2.0; in South Trinidad, 1.8; and in Tobago, 2.4. Short-stay beds at the hospitals are insufficient, and there is a problem of inequity of distribution among the major regions. In addition, there is a poor distribution regarding medical specialties.

Deficiencies in inpatient services have been identified as overcentralized administration; inadequate management, especially for the "hotel" hospital services; deteriorated plant infrastructure; overcrowding in major hospitals and inefficient use of the district hospitals; insufficient operating theatres; inadequate ancillary services, particularly regarding medical records; manpower shortages at the technical and professional level; inadequate maintenance of plant and equipment; and shortages of supplies and equipment at the point of utilization.

Almost all public hospitals lack adequate supplies of

appropriate biomedical equipment. Most of the available equipment is old and with a limited production capacity in terms of service demands. The exception to this is the Eric Williams Medical Sciences Complex, which will start off with very sophisticated biomedical equipment. The equipment also has depreciated significantly due mainly to lack of preventive maintenance, the lack of spare parts, and operator misuse. Procurement of biomedical equipment is not standardized, and no provision is made for its replacement through the accepted accounting mechanism of depreciation.

The country is served by several laboratories that are based mainly at the hospitals. Laboratory services also are provided at the venereal disease division clinics. These laboratories serve both the secondary and primary care services, but they are unequally distributed between the secondary and primary levels. The counties currently continue to suffer from a lack of sufficient laboratory support due to a variety of reasons, including the weak referral system between the health center and the main hospitals where the laboratories are located.

Significant specialized problems affecting the general population have been addressed through vertical and integrated health care programs, including mental health, dental health, Hansen's disease, malaria control, tuberculosis, and alcohol and drug abuse. Because of the reduction in the annual incidence of leprosy and the success of the treatment program since 1984, the services provided to Hansen's disease patients have been integrated into the regular medical care services.

A substance abuse treatment center established in May 1986 includes a drug abuse unit and an alcoholism treatment unit; both offer assessment, detoxification, initial phase rehabilitation, and after care and day care services for patients.

Data on the level of health care provided by the private sector are limited. There are 15 private nursing homes with 292 beds registered in the country, but the actual number of facilities offering private medical and nursing care may be larger. The private sector also provides a wide range of ancillary services such as laboratory and x-ray services, but the quantity, quality, and capacity of these services are largely unknown. In many instances, those who can afford it or those who can make financial arrangements, usually with the aid of a civic organization, seek specialized care in the United States of America or Canada.

Financing of the Health Services

Most health service financing comes from the Government, with the private sector playing a smaller yet significant role. Public health care services are provided free

to all individuals, and funding comes mainly through general tax revenues and through a recently imposed health surcharge levied on employees. The latter funds are incorporated into the Government's consolidated funds and are not necessarily committed to financing the health sector.

From 1982 to 1985, the Government consistently spent 11% of its national budget on health, and most of these funds were allocated to staff salaries. These resources have been mainly concentrated in the secondary care sector, with little reorientation towards the primary care sector.

Although government revenues have been declining since 1981, the budget allocated to the health sector actually increased from 1981 to 1983; the health budget reduction in 1984 marked the beginning of a trend which has continued to the present. Actual Ministry of Health expenditure over the last five years revealed a rise from \$TT267.7 million in 1980 to \$TT575.5 million in 1982, with a subsequent declining trend from 1984 to \$TT475.7 million in 1988.

Over the same period, recurrent expenditure as a percentage of total Ministry expenditure increased steadily from 9.9% in 1980, to 10.8% in 1983, to 15% in 1985. Most of the public health capital expenditure for 1980-1985 was accounted for by the construction of the Eric Williams Medical Sciences Center, a teaching and tertiary hospital facility.

Some institutions charge nominal fees for some services including x rays and private rooms, but these in no way cover the full cost of providing any of these services; generally, user fees are waived altogether, since the 1943 legislation to collect these fees in the hospitals is now outdated.

In the private sector, ambulatory care is offered by private practitioners on a fee-for-service basis. Private hospitals and nursing homes receive concessions from the Government as duty exemptions on equipment and foreign exchange for importing drugs and supplies.

In 1983, there were 28 firms offering private health insurance: 23 were local companies, 3 were Caribbean, and 1 each from Canada and the United States of America. An estimated 43% of the amount collected was paid out in claims. By 1986, the largest company no longer offered insurance to public servants, because it maintained that claims had begun to exceed premiums. Most plans are part of worker fringe benefit packages in the private sector.

In accordance with the policy to ensure collaboration with nongovernmental organizations, the Government provides annual financial support to about 12 organizations, including some that deal in family planning, drug abuse, blood banking, and the disabled. In 1986, this support totaled \$TT7.5 million; in the case of the two

organizations providing services to the physically and mentally handicapped, approximately \$TT3 million were allocated to each, representing approximately 95% of their budgets.

Human Resources

The country suffers from a major shortage of health professionals, especially in the allied health professions; a comprehensive study of specific human resources remains to be conducted. The situation in 1986 for selected categories is shown in Table 1.

TABLE 1

Health personnel in selected categories, ratio of personnel per 100,000 population, and population per health worker, Trinidad and Tobago, 1986.

| Category | No. | Ratio | Population per worker |
|---------------------------------------|-------|-------|-----------------------|
| Physicians | 1,103 | 92.0 | 1,087 |
| Dentists | 129 | 10.8 | 9,296 |
| Nurses ^a | 3,344 | 278.9 | 359 |
| Public health inspectors ^b | 131 | 10.9 | 9,154 |
| Pharmacists | 496 | 41.4 | 2,418 |
| Social workers ^c | 45 | 3.8 | 26,649 |
| Radiographers | 60 | 5.0 | 19,987 |
| Physiotherapists | 18 | 1.5 | 66,622 |
| Mental health officers | 25 | 2.1 | 47,968 |
| Public health nurses | 256 | 21.4 | 4,684 |

^aIncluding midwives.

^bMinistry of Health only.

^cMedical and psychiatric.

Source: Ministry of Health.

Health human resources are unevenly distributed between primary and secondary care resources, among specialties, and among geographic regions; some areas, particularly the primary health care services, are also affected by rapid staff turnover.

Medical/health professional and paraprofessional training and technical courses in the country are undergoing expansion and rationalization. Approximately 35 Trinidad and Tobago doctors graduate from the University of the West Indies Medical School each year, and students are accepted at the Port of Spain General Hospital for the final two years of their clinical training. Post-graduate education for doctors is mainly offered at the University of the West Indies' Mona Campus and at Port of Spain and San Fernando General hospitals.

Nurses' training schools in the two general hospitals offered a three-year diploma course in nursing. These schools are now being transferred to the National Institute for Higher Education, Research, Science, and Technology. St. Ann's Psychiatric Hospital also offers a three-year course in psychiatric nursing. Public health nursing, midwifery, and psychiatric nursing are also taught at a post-basic level. A dental nursing training program has been under way since 1976; up to 1980, 33 dental nurses graduated from this course.

HEALTH AND THE ENVIRONMENT

The demands of a growing population, increasing urbanization and industrialization, and expanding agricultural production have created new environmental health problems. The proliferation of heavy metals, inorganic chemicals, and toxic substances in the environment is associated with increases in cardiovascular diseases and malignant neoplasms, two of the five leading causes of death in the country.

No monitoring programs have been established to quantify the concentration of chemical pollutants in the air or water. A PAHO/WHO survey conducted in 1984 identified more than 800 manufacturing establishments that could be discharging chemicals into the environment and should be subject to regular government surveillance.

In 1981–1984, only five fish kills were recorded, and none of these were attributed to pollution incidents. Twenty fish kills were recorded in 1985–1988, of which ten were attributed to industrial discharges or oil spills.

The number and volume of oil spills since 1984 are shown in Table 2 (no data are available prior to 1984). The number of spills per year has more than doubled since 1984, but this increase may be due to better reporting as a result of surveillance and control programs begun in 1985–1986. The volume of oil spilled and unrecovered each year is significant.

TABLE 2

Number of oil spills and volume spilled and recovered (barrels per year), Trinidad and Tobago, 1984–1988.

| Year | No. of spills | Volume spilled | % recovered |
|------|---------------|----------------|-------------|
| 1984 | 89 | 7,577 | 74 |
| 1985 | 90 | 13,700 | 91 |
| 1986 | 130 | 39,800 | 64 |
| 1987 | 245 | 14,025 | 86 |
| 1988 | 234 | 12,206 | 83 |

While industrialization has brought new environmental health problems, traditional problems have not disappeared and continue to be a matter of concern for waterborne, foodborne, and vector-borne illnesses.

The country enjoys relatively widespread coverage of basic water and sanitation facilities. The percent of the total population covered with water supply services has remained fairly steady at about 98% from 1980 to 1987, with 100% coverage of the urban population during those years and rural coverage increasing from 93.4% in 1980 to 95.2% in 1987. However, the levels of service need to be upgraded. In 1987, for example, while 98.5% of the total population had access to potable water, only 57.1% were served through direct house connections, the balance being served through public standpipes. Similarly, 98.5% of the total population had access to a toilet in 1987, but only 22.8% had sewer connections, the balance being served with septic tanks or latrines. During 1981–1984, the annual rate of foodborne illness ranged from a low of 12.0 per 100,000 to a high of 48.2; in 1985–1988, it ranged from a low of 52.3 to a high of 71.1. This may be due to the rising numbers of unlicensed roadside vendors that have occurred as a result of increasing unemployment.

A 1984 survey found that inadequate maintenance was a problem affecting the performance of all public and private sewage treatment facilities. A more recent survey (1986) of 86 small sewage treatment plants found that maintenance has been neglected at nearly all, much equipment is nonoperational, and effluents are of very poor

quality. In virtually all public and private sewage treatment plants, disinfection of effluents is either unreliable or nonexistent.

The Institute of Marine Affairs, although not equipped to perform routine monitoring of coastal waters, surveyed ten popular bathing beaches since 1985, and found excessive coliform densities at seven of them. The Institute of Marine Affairs attributed most of the contamination to untreated or inadequately treated sewage discharges. One site in Tobago was found to be contaminated by agricultural runoff.

The solid waste management situation has improved greatly as a result of actions taken in the early 1980s. In 1980, the Solid Waste Management Company, Ltd. was established to provide technical and managerial assistance to solid waste authorities. Today, the Company collects some 320,000 tons of solid waste annually and disposes of them in six sanitary landfills; however, it estimates that annually some 16,000 tons of hazardous wastes are being generated and disposed of in the same manner as non-hazardous wastes. Hence, there is a need to establish a national hazardous waste disposal facility.

Though there is indiscriminate use of pesticides in agriculture, its importance as a public health problem has not been assessed.

While food labeling is mandatory, nutritional labeling is optional. In general, however, food labeling provisions in the law are not strictly observed, and expiration dates and names and addresses of manufacturers are often not provided.

TURKS AND CAICOS ISLANDS

GENERAL CONTEXT

Political, Economic, and Social Situation

The Turks and Caicos Islands, a British crown territory, comprises eight main islands, six of which are inhabited, and many small cays. A Governor serves as the Queen's representative and presides over an Executive Council which includes the Chief Minister, four Ministers (responsible for social services, works, natural resources, and commerce and development), and three official members (the Chief Secretary, the Attorney General, and the Finance Secretary). The Legislative Council has eleven elected members and four appointed ones. The Chief Minister is elected by the Legislative Council and then appointed by the Governor.

The economy is based on tourism, fishing, and offshore banking. Tourism has increased, especially on Providenciales. 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. Custom duties remain the highest single source of revenue. There are no income or property taxes.

In 1989, the islands did not show a deficit for recurrent expenditure as in the past. Consequently, aid for the recurrent budget is not required from Great Britain this year, but aid is still required for capital expenditures. The sum previously provided to support recurrent expenditures is now being added to capital aid. Total recurrent budget for 1988–1989 (revised) was \$US20,067,000. Capital revenue through United Kingdom Development Aid is \$US23,923,000. Per capita income is estimated at \$US3,000.

There are no reliable employment data, but unemployment is roughly estimated at 20% of the labor force. Most new jobs created over the past four years are in Providenciales. New employees are largely immigrants from Haiti and the Dominican Republic.

The public education system consists of primary and secondary schools, an evening institute which provides additional opportunity to complete a high school education, a business college, and a vocational training institute which opened in 1984. There are a few private schools. The Health Department intends to cooperate

with the education department in establishing a preparatory health sciences training program in the school system. Adult literacy is estimated at 85% for nationals.

Housing is still inadequate, but there has been some improvement with the construction of new units. Legislation has been enacted to provide building standards.

Practically all food consumed is imported.

Demographic Characteristics

The total population in 1989 was estimated at 14,000. According to health and education sector figures, the age distribution of the population was assessed as follows: under 5 years, 1,780 (12.7%); 5 to 14 years, 4,370 (31.2%); and 15 years and over, 7,850 (56.1%). It is estimated that there are 3,220 women of childbearing age (15–44).

Population growth between 1980 and 1987 is estimated at 7.5% per year; the increase is due mainly to migration of workers from Haiti and the Dominican Republic. This speed of growth puts pressure on the existing health services. With an influx of poor, non-English-speaking peoples, new needs have to be addressed.

Life expectancy at birth is estimated at 66 years. The crude birth rate for 1986 was 23.1 per 1,000 population and the crude death rate for 1985 was 6.1. The infant mortality rate was 22 per 1,000 live births (1986). The small size of the population and the small number of vital events give rise to substantial annual changes in the rates.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

The leading causes of death are cerebrovascular accidents, congestive heart failure, cancer, and myocardial infarction. The leading causes of morbidity are cardiovascular disorders, hypertension, diabetes mellitus, influenza, and urinary tract infection.

The National Health Plan identifies the control of AIDS and sexually transmitted diseases as priorities. In 1987, the incidence of gonorrhea was 42 per 10,000 population and of syphilis, 30 per 10,000. Nine cases of AIDS have been diagnosed and 143 persons were found to be seropositive for HIV and were confirmed by

Western Blot assay. These data result from a limited testing program.

Other priorities identified by the National Health Plan are: improving care for prevention and control of chronic diseases (heart diseases, hypertension, diabetes mellitus); improving health education and counseling services; improving care for the mentally ill; providing services for the mentally and physically handicapped; improving oral health; monitoring and improving nutrition status; preventing traffic accidents; and controlling tuberculosis and Hansen's disease.

DEVELOPMENT OF HEALTH SERVICES INFRASTRUCTURE

The director of the Health Department is the Chief Medical Officer, who also serves as Hospital Medical Director. There are three other Medical Officers in Grand Turk, one in Providenciales, and one in South Caicos.

The major problems for the health system, as identified in the National Health Plan, are: improvement of the health information system; availability and training of human resources; improved maintenance of facilities and equipment; improvement of health clinics; provision of more health facilities in Providenciales; and continued upgrading of Grand Turk Hospital.

The growing importance of tourism to the economy requires that environmental health problems be addressed and that adequate emergency care be assured. Adequate emergency care services for tourists are available through the private sector on Providenciales, the main tourist island. However, services on this island need to be expanded to meet local health needs.

Ten clinics distributed throughout the islands provide prenatal and postnatal care, child health and general medical services, health education, and counseling services. All births take place in the hospital or at the health centers.

The Grand Turk Hospital (36 beds) constitutes the core of the health care services for the islands. It has recently been renovated and expanded to provide accommodation for the health administrative unit and to provide accident and emergency services. The role of the hospital in primary health care is being strengthened, but much remains to be done. The private sector provides a health and medical care facility in Providenciales.

Maintenance of facilities and equipment throughout the sector is still inadequate. The difficulty in getting spare parts for equipment brought from Europe remains an important problem.

Membership in the Eastern Caribbean Drug Services Program, for which the islands have applied, would benefit the availability of supplies and drug quality control.

Laboratory and x-ray services have been improved.

The recurrent budget for health was \$US1,257,406 in 1986–1987, \$US1,297,885 in 1987–1988, and \$US2,118,556 in 1988–1989. For 1987–1988, the health budget amounted to 9.9% of total expenditure. Estimates for 1988–1989 place health expenditure at approximately 10.5% of total recurrent expenditure.

Available human resources in health are: five medical doctors, two dentists, forty nursing personnel (including a chief nursing officer), sixteen staff nurses (including one senior staff nurse), four public health nurses (including one senior public health nurse), and sixteen clinical nurses. There are also three public health inspectors, two medical laboratory technicians, two dental auxiliaries, five geriatric aides, and nine community health aides. In recent years, the human resources situation has markedly improved, particularly in nursing. Sixteen nationals are being trained, one as an M.D., nine as staff nurses, and six as community health aides.

HEALTH AND THE ENVIRONMENT

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 and middle Caicos Islands. Only 50% of the population in Grand Turk has the necessary storage of 2,000 gallons per person to carry them through the 200-day annual dry season. The amount of water provided from public storage (about 2.5 gallons per capita per day) is inadequate to meet basic needs for potable water. Consequently, toilets are unflushed, resulting in unsanitary conditions.

The water quality monitoring program of the Public Health Department is limited. However, it indicates that water is of poor quality, mainly because of inadequate supply sources (collection methods and storage). Poor taste, odor, and color, as well as poor bacteriological quality, are the main problems.

Some of the population located in the four towns dispose of human waste through an on-site sewage disposal system. No public sewerage system exists in Grand Turk. Hotels, government buildings, and about 40% of private dwellings depend on saltwater flushing systems that discharge directly into underground seawater. Three-quarters of the population uses privies. Although guidance is available through the Government, many of the privies are poorly located and improperly constructed. In general, the rocky ground makes installation of septic tanks expensive and difficult, contributing to the pollution of shallow surface wells. The Public Health Department is initiating a program of advice and partial assistance for self-help construction of latrines.

Solid waste collection and disposal is carried out by government trucks in Grand Turk and South Caicos. However, in the other islands waste is collected by private contractors and disposed of at public dumping sites.

The Public Health Department has an active inspection program for food establishments and requires certificates

for food handlers. No regulations at present govern sanitary control of housing.

High populations of mosquitoes and sandflies are long-standing problems. The Public Health Department is seeking assistance to develop and implement a cost-effective vector control program.

UNITED STATES OF AMERICA

GENERAL CONTEXT

Political, Economic, and Social Situation

The United States of America is a federal republic comprising 50 states. The Federal Government is constituted by the executive, legislative, and judicial branches. The President, the Chief Executive, is elected for a four-year term, and may serve no more than two consecutive terms. The Congress is bicameral, consisting of a Senate (six-year terms) and a House of Representatives (two-year terms). The federal judiciary system is headed by the supreme court, and comprises nine justices appointed for life. Powers not specifically assigned to the Federal Government by the United States constitution remain with the 50 states. These include primary responsibility for the public health. The country's total population in 1989 was estimated at around 250 million; it will next be enumerated in the decennial census of 1990.

Gross domestic product (GDP) for 1987 was \$US4,497.2 billion, or \$US18,448 per capita. The GDP was divided among three sectors: business (\$US3,855 billion including \$US75.9 billion for farm GDP); household and institutional (\$US168.9 billion); and government (\$US472.7 billion). Public expenditures accounted for 35.0% of the GDP in 1987. The annual percentage rate for inflation was calculated at 1.9% in 1986.

The percentage of unemployment for 1986 was 6.9, down from 7.1% in 1985. Among the sectors of the economy, services accounted for 31.3% of total employment, wholesale and retail trade for 20.8%, and manufacturing for 19.1%.

In terms of income distribution by households, 7.5% had annual incomes of less than \$US5,000 in 1985, while 15.4% had incomes in excess of \$US50,000. More than half of the nation's households had annual incomes between \$US15,000 and \$US50,000.

In 1986, the median number of completed school years in the adult population aged 25 and above was 12.6 years. Approximately one-fourth of this population had completed fewer than four years of high school.

As of 1985, it was estimated that the country's population spent 13.5% of its income on food.

Demographic Characteristics

As of 1 July 1987 the country's total population was estimated at 243,915,000: approximately 119 million were male and 125 million, female. Infants and children under 5 years of age accounted for 18.2 million. Nearly 30 million were aged 65 and older, with nearly 3 million having attained 85 years of age.

In 1980, the most recent year for which data are available, 73.7% of the U.S. population lived in urban areas. In 1986, an estimated 13.6% of the population was considered to have incomes below the poverty level.

The crude birth rate in 1986 was 15.7 per 1,000 population. The fertility rate for the same year was 66.1 per 1,000, and the rate of natural increase was 7.0 per 1,000. International immigration was estimated at 900,000 in 1986.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality

All states have adopted laws that require the registration of births and deaths and the reporting of fetal deaths. It is believed that more than 99% of the country's births and deaths are registered.

Several studies have been undertaken on the quality of medical cause-of-death certification. In general, these have been conducted for relatively small samples and for limited geographic areas. One index of the quality of cause-of-death reporting is the proportion of death certificates coded as symptoms, signs, and ill-defined conditions, according to Chapter XVI of the *International Classification of Diseases*, Ninth Revision. Although there are cases for which it is not possible to determine the cause of death, the size of this proportion indicates the care and consideration given to the certification by the medical certifier. In 1986, 1.5% of all reported deaths in the United States were assigned to ill-defined or unknown causes. However, this percentage varied from state to state, from 0.3% to 4.0%.

For 1986 the five leading causes of death in the country (with their age-adjusted death rates per 100,000 popu-

lation) were: (1) diseases of the heart (175.0); (2) malignant neoplasms (133.2); (3) accidents and adverse effects (35.2); (4) cerebrovascular diseases (31.0); and (5) chronic obstructive pulmonary diseases (19.4).

For 5 of the 13 leading causes of death (diseases of the heart, malignant neoplasms, cerebrovascular diseases, chronic liver disease and cirrhosis, and atherosclerosis), the age-adjusted death rates decreased between 1985 and 1986. The largest declines were for atherosclerosis (8%), and for chronic liver disease and cirrhosis and for cerebrovascular diseases (4% each). The age-adjusted death rate for diseases of the heart declined 3%.

Increases in the age-adjusted death rates between 1985 and 1986 occurred for 6 of the 13 leading causes: accidents and adverse effects, chronic obstructive pulmonary diseases and allied conditions, pneumonia and influenza, suicide, homicide and legal intervention, and septicemia. The largest increase, 8%, was for homicide and legal intervention, the first increase for this cause since 1980. Septicemia increased by 5%, continuing the rapid rise observed for the past three decades. The age-adjusted death rate for suicide increased by 4% between 1985 and 1986, reaching a level higher than that of 1979.

Years of potential life lost before age 65 is a measure of premature mortality. In 1986, 12.1 million years of potential life were lost before age 65 in the United States. The leading causes of premature mortality were accidents among males and cancer among females. Among black males, the years of potential life lost from homicides was almost as large as that from accidents.

In 1986, the average expectation of life at birth reached a record high of 74.8 years, which followed the general upward trend in life expectancy in the country. In 1986, life expectancy for females was 78.3 years, compared with 71.3 for males; both figures represent increases from 1985 figures. The difference in life expectancy between the sexes, which had been widening from 1900 to 1972, has narrowed since 1979.

Between 1985 and 1986 the white population experienced an increase in life expectancy to a record high of 75.4 years; the black population, on the other hand, experienced a decrease to 69.4 years, to the same level as in 1982. This is the first time that a decline in life expectancy has occurred two years in a row for the black population since 1970, the first year that the life expectancy data for the black population became available on an annual basis. While the difference in life expectancy between the white and black populations narrowed from 7.6 years in 1970 to 5.6 years in 1983 and 1984, it has increased since then to 6.0 years in 1986. Among the four race-sex groups, white females continued to have the highest life expectancy at birth (78.7 years), followed by black females (73.5 years), white males (72.0 years), and black males (65.2 years).

Health Situation of Specific Population Groups

Health of Children and Youth

The current child health situation shows progress in several areas, but it also reflects some problems that pose major challenges. In the 35 years between 1950 and 1985, the overall death rates (per 100,000 resident population) dropped from 3,299.2 to 1,067.8 for infants under 1 year; from 139.4 to 51.4 for children 1–4 years; from 60.1 to 26.3 for those 5–14 years; and from 128.1 to 95.9 for the 15–24-year-old population. These data reflect major gains with regard to infant mortality and significant advances in combating mortal illness among older children and adolescents. However, maintaining the momentum in reducing infant mortality has recently proved difficult, and new patterns of morbidity are complicating health care for older children and adolescents.

The new patterns of morbidity are contributing to change the distribution of causes within the overall decreasing death rate for children. For instance, between 1950 and 1985, the death rate from motor vehicle accidents for age groups under 14 decreased substantially, but for those in the 15–24 age group it increased slightly. The difficulty in improving rates in the age group that includes older adolescents points to motor vehicle accidents, associated with the problem of substance abuse, as a major public health problem among youth.

In 1986 there were 38,891 deaths of infants under 1 year of age. That year's infant mortality rate of 10.4 infant deaths per 1,000 live births was the lowest rate ever recorded for the United States, and it compares with a rate for the previous year of 10.6. Among white infants, the rate was 8.9, a decline of 4% from 1985 (9.3); the rate for black infants was 18.0 in 1986 compared with 18.2 in 1985.

While major strides have been made in reducing the infant mortality rate in the country (an all-time low, provisional estimate of 10.0 per 1,000 live births has been made for 1987), progress has slowed from 4.7% per year during the 1970s to 2.8% per year during the 1980s. In addition, rates in certain geographic areas and for certain racial and ethnic groups, particularly for blacks, substantially exceed the national rate. Further reduction of the infant mortality rate will require a concerted national, state, and local effort. Financial, educational, social, and logistic barriers to care must be addressed.

From 1970 to 1981 low birthweight declined 1.3% per year. The rate was relatively stable for the years 1981–1986. In 1986, the number of infants born weighing under 2,500 grams was 255,500 (6.8%). About two-thirds of the decline in low birthweight during the decade of the 1970s was due to a reduction in intrauterine

growth retardation and only one-third to a reduction in preterm delivery. Smoking is estimated to account for 20% to 30% of all low birthweights in the country.

In 1983, the United States reached its highest level of coverage from vaccines against all five of the common preventable childhood diseases (measles, rubella, DPT, polio, and mumps). Recently, however, a reported increase in the incidence of measles and mumps suggests that the fully immunized population of children may be declining. Additionally, immunization rates are generally lower for children who are non-white and poor, and who live in inner cities.

Half of schoolchildren have no permanent-tooth decay, as compared with 36.6% in 1980 and an estimated 28% in the early 1970s. Not only are fewer children getting cavities today, but those who do are getting fewer of them. In 1980, children had an average of five decayed, missing, or filled surfaces on their permanent teeth as compared to three in 1987.

Decreases in the incidence of dental decay have been largely attributed to the presence of fluoride in community water supplies and in toothpaste and other vehicles. However, despite proven preventive techniques, dental caries continues to be a major childhood health problem, and it is a problem which increases with age. Although half the children aged 5–17 were caries-free in the 1986–1987 national survey, by age 15, 78% of the children had experienced dental caries in permanent teeth.

In addition to age variation in frequency of caries, there is also variation relating to population groups. American Indian and Alaskan Native children and youth, for instance, have more problems with dental caries than does the general population of children and youth.

Substance use/abuse is an extraordinarily important health problem for children and youth. The following data represent selected findings from the National Adolescent School Health Survey of a large sample of eighth- and tenth-grade students:

- **Cigarette Use:** Fifty-one percent of eighth-grade students and 63% of tenth-grade students reported having tried cigarettes, and 16% of eighth-grade students and 26% of tenth-grade students reported having smoked a cigarette during the past month.

- **Alcohol Use:** Seventy-seven percent of eighth-grade students have tried alcohol, and of these, 55% reported first trying it by grade six. Eighty-nine percent of tenth-grade students reported having tried an alcoholic beverage; of these, 69% reported first use by grade eight. Twenty-six percent of eighth-grade students and 38% of tenth-grade students reported having had five or more drinks on at least one occasion during the past two weeks.

- **Marijuana Use:** Fifteen percent of eighth-grade students reported having tried marijuana, and of these, 44% reported their first use by grade six. Thirty-five percent

of tenth-grade students reported having tried marijuana, with 56% of them reporting first use by grade eight. Six percent of eighth-grade students and 15% of tenth-grade students reported having used marijuana during the past month.

- **Cocaine Use:** Five percent of eighth-grade students and 9% of tenth-grade students reported having tried cocaine. Two percent of eighth-grade students and 3% of tenth-grade students reported having used cocaine during the past month. Of those who have tried cocaine, approximately one-third have tried crack. Two percent of eighth-grade students and 3% of tenth graders reported having tried the crack form of cocaine.

Teen-age pregnancy. One out of every ten women aged 15–19 in the country becomes pregnant each year, a proportion that has changed little during the past 65 years; of these, five out of six have unintended pregnancies. In 1988, there were about 837,000 pregnancies among women aged 15–19, and another 23,000 among those aged 14 and younger. There is widespread public concern over the need for public policies and programs that would reduce the incidence of unintended adolescent pregnancy. The teenage pregnancy rate is high because only a minority of sexually active young women (1 in 3) always use contraceptives. Intervention strategies that include high quality health education combined with the provision of health services are promoted especially for high-risk youth groups.

Injuries and emergencies. Injury is the number one cause of death for all ages from 9 through 44 months. For the age group 0–14 years old, injuries result in about 10,000 deaths per year. This represents approximately 44% of all deaths for the 1–4 age group, 51% of all deaths for the 5–9 age group, and 58% of all deaths for the 10–14 age group. Average annual injury death rates for the years 1980–1985 per 100,000 were 19.3 for the 0–14 age group, 33.9 for the 0–1 age group, 25.4 for the 1–4 age group, 14.4 for the 4–9 age group, and 16.2 for the 10–14 age group.

Of these 10,000 deaths, 37% are related to motor vehicles, including bicyclist and pedestrian deaths involving motor vehicles. The other leading causes of injury deaths in the 0–14 age group were drowning (14%), house fires (12%), and homicide (10%).

The injury death rate for the 0–14 age group decreased by 16% from 1980–1985, with rates declining for almost all causes of injury. Suicide is a notable exception—the suicide rate for the 10–14 age group more than doubled during the same time period.

The ratio of male to female death rates is 1.7 to 1 for all causes combined, but male suicide rates are four times those for females.

About 19 million children age 0–14 require medical care each year as a result of injuries. About two million are incapacitated for at least two weeks, and 100,000 are permanently disabled. The rate of injuries and deaths due to injuries climbs abruptly after age 14, largely due to the increase in serious motor vehicle accidents. There are also steep increases in homicide and suicide.

Among all youth aged 15–19, including females, blacks, and Native Americans, there has been a rising trend in deaths from suicide since the 1950s. In fact, suicide is the third leading cause of death among young people 15 to 19 years old. Psychiatric disorders, especially depression and personality disorders, and alcohol or drug abuse are important contributors to the suicide risk in this group. Exposure to others' suicide, prior suicide attempt, incarceration, running away from home, unemployment, homosexual preference, recent severe stress, and unplanned pregnancy may also increase the risk for suicide in this age group.

Homicide also is a problem of increasing concern for children and youth. Among adolescent blacks, it is the second most frequent cause of death; for adolescent whites, although less frequent, it is still a major cause of death.

The 15–24 age group has the second highest injury death rate after the very elderly, age 75 and older. The lowest rates are for the 8–12 age group. The adolescent age group has an especially high rate of deaths from firearms compared to other age groups. The 15–24 age group represents 16.5% of the total population, but accounts for 63% of the deaths due to injury.

There are some major racial differences. For black males aged 15–34, homicide leads all causes of death. Mortality rates due to homicide are 5 to 12 times greater among black male youths than among their white counterparts. Careful analyses indicate that these differences reflect socioeconomic rather than racial factors.

Data on suicide probably represent sizable undercounts, but just how much is unknown. Suicide is the second leading cause of death, after motor vehicle deaths, among persons 15–24 years old. The rate for whites is almost double that for other races.

Chronic illnesses and disabilities. Available data indicate that more than 30% of all children under age 18 in the United States (approximately 20 million children) are affected by some chronic physical or mental condition, although these data also suggest that only a small proportion of the affected children require prolonged and expensive medical treatment. The latter, who number nearly 3.2 million and represent 5% of all noninstitutionalized children under 18 throughout the country, exhibit some degree of disability because of their chronic illness.

The risk of disability in children increases with age.

The risk of disability also varies with sociodemographic status: children residing in families with incomes below the poverty level are almost 50% more likely to exhibit some disability than children from families with incomes above the poverty level.

Health of Adults

As of July 1987, approximately 123 million persons, slightly more than half the total population, were between the ages of 25 and 64. The most important causes of mortality and morbidity for this segment of the population were chronic diseases and trauma.

Long-term trends in mortality in the United States continue to be favorable. Improvements in overall mortality are largely the result of declines in chronic diseases. Trends in mortality for trauma, however, have not decreased consistently—between 1985 and 1986 substantial increases in mortality occurred for the age group 25–44. Increases are also observed in drug-related deaths and from AIDS. There is also evidence for widening differentials in mortality between men and women and between black and white populations. These contrast with narrowing differences between these groups for many years.

Trends in chronic disease are generally encouraging. Between 1970 and 1985, heart disease mortality among persons 45–64 years old declined by about 3% per year. Stroke mortality has declined by more than 50% during that same 15 year period. Among the probable causes of this dramatic improvement are increased control of elevated blood pressure, smoking cessation, dietary changes, reduced serum cholesterol levels, and improved medical care.

In contrast to these gains, death rates for lung cancer increased between 1970 and 1985. Among males the rate rose slowly until 1980 and has been fairly stable since that year. Among females, however, the lung cancer death rate almost doubled between 1970 and 1980 and continued to increase through 1986.

Between 1983 and 1987 cigarette smoking continued to decline steadily. The age-adjusted percent of men 20 years of age and older who smoke cigarettes declined from 35% in 1983 to 32% in 1987; smoking among women decreased from 30% in 1983 to 27% in 1987.

The age-adjusted death rate from accidents of all types stood at 35.2 per 100,000 population in 1986, down from 42.3 in 1980 but slightly higher than the 1985 rate of 34.7. Motor vehicle accident rates, however, were higher in 1986 (15.4 per 100,000 population) than in any of the previous three years, as were the rates for suicide (11.9) and homicide (9.0).

Health of the Elderly

The health of the aged in the United States has changed dramatically since the beginning of the century. In 1900, life expectancy was 47 years. Now it is 75 years—28 more years of life on the average. The aged also are the most rapidly growing segment of the country's population: today, one in every eight citizens is 65 years of age or older; by the year 2025, one in every five citizens will be aged.

This section presents several measures of the health of older persons. These measures are all based on household interviews of persons in the civilian noninstitutionalized population; therefore, it is important to note that the 1.3 million elderly living in nursing homes in 1985 are excluded from this analysis. This exclusion has implications for interpreting the data: first, elderly in nursing homes are generally in poor health, have multiple chronic conditions and impairments, and have severe limitations in functioning; second, on an average day in 1985, about 22% of persons aged 85 and over resided in a nursing home. Therefore, comparisons of persons 85 and over with younger groups of the aged should be interpreted with caution.

Respondent-assessed health is a basic, overall measure which is correlated with use of health care. One-third of the elderly were reported in excellent or very good health and one-third in fair or poor health. These figures remained stable regardless of age. The reported health of black older Americans was poorer than that of their white counterparts: about one-fourth of black elderly were reported in excellent health and about one-half in fair or poor health. In contrast to the stability of health status regardless of age, rates of major activity limitations were higher for persons aged 85 and over.

In terms of limitation of activity, 60.4% of those older than 65 were reported to have no significant limitation, as compared with 70.4% for the 55–64-year age group. For those over 85, 40.4% of the noninstitutionalized population reported no activity limitation.

For those aged 65 and over, rates of chronic conditions often differ by age, sex, and race. Rates for hypertension were higher for white females than for white males at each age. Further, the rate was considerably higher for black females than for white. Rates of diabetes were about 50% higher for black males than for white. The contrast among women was even greater: rates for diabetes were 150% higher for black females than for white.

Arthritis was the most commonly reported chronic condition, affecting 485.6 out of every 1,000 persons. Among black females, 639.6 out of every 1,000 aged 65 and above were affected, as compared with 392.2 per thousand for white males and 540.4 for white females.

Rates of hearing impairments and visual impairments

(blindness in one or both eyes or trouble seeing) increased with age. By age 85, about 50% had a hearing impairment and 22% a visual impairment. Of the race and sex subgroups 65 years and older, white females had a higher rate of cataracts and white males a higher rate of hearing impairments.

One measure of the ability of older persons to lead active, independent lives is their level of functional limitation. This is assessed in terms of their need for help from another person in activities of daily living (e.g., walking, bathing, dressing) and in activities for community living (e.g., shopping, managing money, and doing daily housework). From 5% to 6% of the elderly 65 and older received help from another person in bathing, going outside the house, and walking. Eleven percent received help in shopping. Those aged 85 and older received more help in most activities for daily living and for community living. Of particular importance to independent living is the cognitive ability of managing money, such as keeping track of expenses or paying bills. About one-fourth of this oldest age group needed help in managing money.

Problems Affecting the General Population

Disaster Assistance

From 1987 through 1988, tornadoes accounted for the largest number of deaths and injuries due to disasters. In terms of the health impact from a single disaster, the Saragosa, Texas, tornado resulted in the largest mortality (30 deaths) and the Whittier Narrows earthquake resulted in the largest morbidity (950 injuries).

The incidence and health impacts of disasters appear to be much smaller in the United States than in many other countries. However, potential risks remain and may be expanding due to increasing population densities, growing dependence on technologic advances for subsistence, and increased transportation and use of potentially hazardous materials. In order to deal with these risks, the Centers for Disease Control (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR) have been working to better quantify and characterize the unintentional release of chemicals and the resulting health effects. Assessment of reports filed with three different federal agencies has shown that during 1986 there were 587 releases that resulted in 115 deaths and 2,054 injuries. These estimates should not be considered comprehensive due to different reporting criteria and completeness. A second activity has involved health input into emergency planning and response activities. These activities have included assisting other federal agencies along with state and local governments with planning

activities for providing medical care, medical supplies, and public health actions in response to a catastrophic earthquake.

Diseases of Regional Importance

Dengue viruses are not endemic in the United States, but imported cases of dengue fever occur each year. This number depends upon the travel patterns of U.S. tourists and upon the amount of dengue activity occurring in tropical areas of the world. Since 1980, the number of confirmed imported cases of dengue fever has ranged from a low of 5 cases in 1984 to a high of 45 cases in 1982. The principal mosquito vector of dengue, *Aedes aegypti*, is indigenous in Gulf Coast states from Texas to Florida and occurs during the summer months in many other southern and border states. Infestation by another possible vector, the *Aedes albopictus* mosquito, has been confirmed in at least 12 states since 1985. After an absence of 35 years, indigenous transmission of dengue has occurred twice in this decade.

In 1988, no cases of human rabies were reported in the United States. Cases of animal rabies, mostly in skunks and raccoons, remained at high levels especially in the upper Midwest and Middle Atlantic states, respectively. Although rabies in dogs is reported every year from the border area, several counties in Texas along the Mexican border reported a canine rabies epizootic for the first time in many years.

A total of 4,905 imported cases of malaria have been reported in the period 1984–1988. Of these, 2,685 were among foreign civilian travelers. Malaria risk for U.S. travelers is highest for travelers to Africa and New Guinea, ranging from 1:926 for travelers to Kenya. The risk of acquiring malaria is much less for U.S. travelers to India (1:1,450), Pakistan (1:5,263), and Haiti (1:4,762). U.S. travelers to other countries have a negligible risk of developing malaria.

HIV/AIDS

Human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS) remain the number one public health problem and priority in the country. By the end of 1988, a provisional total of 82,764 diagnosed AIDS cases had been reported to CDC; more than 30,000 cases were reported in 1988 alone. These numbers will continue to increase in the next several years, as many of the estimated 1.0 million to 1.5 million Americans currently infected with HIV develop AIDS.

In 1988, state and local health departments reported 32,311 AIDS cases in the United States and its territories. Excluding the territories, these patients represent an an-

nual incidence rate of 13.7 AIDS cases per 100,000 population overall, 31.2 cases per 100,000 men, and 3.2 cases per 100,000 women (based on 1980 census data). Although the number of AIDS cases reported each year continues to increase, the rate of increase has steadily declined, except in 1987 when CDC's revised AIDS case definition resulted in an abrupt increase in the number of reported cases.

Projections made in May 1988 suggest that approximately 365,000 AIDS cases will have been diagnosed in the United States from 1981 through the end of 1992, with 263,000 cumulative deaths. The expected annual number of diagnosed and reported cases is projected to increase by about 10,000 each year, from 39,000 cases in 1988 to 80,000 cases in 1992. It is projected that a total of 172,000 AIDS patients will require medical care in 1992, at a cost expected to range from \$US5 billion to \$US13 billion.

Fifty-six percent of all AIDS patients and 85% of those diagnosed before 1986 are reported to have died. Because reporting of deaths to CDC is incomplete, the actual case-fatality ratio is much closer to 100% within five years after diagnosis of AIDS. In 1987, AIDS deaths represented 10% of all deaths in men 25–34 years of age and 8% of all deaths in men 35–44 years of age; for women, these figures were 3% and 1%, respectively.

Although homosexual and bisexual men still account for the majority of AIDS cases, AIDS surveillance has documented an increasing role of intravenous (IV) drug users in the transmission of HIV. The epidemic also has become more pronounced in minority communities, with blacks and Hispanics accounting for a disproportionately large share of the burden of AIDS in the country. In 1988, blacks and Hispanics had the highest annual incidence rates per 100,000 population (34.9 and 28.9, respectively), followed by whites (9.6), Asians/Pacific Islanders (5.4), and American Indians/Alaskan Natives (2.2). This disproportion is greater for women and children and is strongly associated with IV drug use by heterosexuals.

In January 1989 there were approximately 1,300 children aged 0–12 and over 300 adolescents aged 13–19 with AIDS in the United States. A key route of infection is *in utero* transmission from drug-using mothers who are HIV positive. Another route of infection was through blood transfusions before blood screening procedures were instituted. The latter exposed many hemophiliacs to AIDS. At present there are 741 hemophiliacs with AIDS, and many of them are children and adolescents.

Oral Health

United States schoolchildren have 36% less tooth decay than they did at the beginning of the 1980s. Dental caries

is a disease that is distributed disproportionately within the population: 60% to 75% of the total amount of the disease occurs in only 20% of children, often those from immigrant, migrant, minority, or lower socioeconomic groups. More than one-third of the population served by public water supplies lacks the benefit of fluoridated water, and approximately half of the total population does not have access to optimally fluoridated water.

Each year, some 29,500 new cases of oral cancer are discovered and 9,400 deaths related to oral cancer are reported in the country. Tobacco users are at significantly higher risk of developing oral cancers. Adult periodontal disease remains a significant chronic disease; it is addressed inadequately by the current public health system.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services System

The goal of the United States health care system is to ensure access to good quality health care, delivered in an equitable way at a reasonable cost. The health system is characterized by multiple points of interaction among patient, provider, institution, and payer. The health care system emphasizes the patients' freedom of choice of providers.

A major concern with the country's health care system is its rising cost. National spending on health in 1987 was \$500.3 billion, representing 11.1% of the gross national product. Of total health expenditures, 39% went for hospital care, 20% for doctors, and 8% for nursing home care. About 25% of all bills were paid directly by patients, 32% by private health insurance, and 41% by the Government. Most of the public spending was accounted for by the two major federal programs, Medicare (which provides comprehensive health care for the elderly) and Medicaid (which is a federal-state partnership designed to assist low-income individuals meet their medical costs under a variety of programs). Personal health care expenditure per capita was \$US1,758 in 1987. A variety of efforts have been undertaken to control escalating costs.

A major priority for the country's health care system is to improve access to health care for all population groups. Certain groups, such as some of the minority populations and homeless individuals, still have difficulty gaining access to care. In addition, concern has been increasing about ensuring the quality of care.

Production of Services

Recent changes in the provision of health services include: (1) a reduction in the inpatient census counts of short-term general hospitals; (2) an increase in the severity of illness of those who are hospitalized; and (3) an increase in the types of care (such as minor surgery) provided in ambulatory settings.

In 1986, there were 6,035 short-stay hospitals (275 fewer than in 1975), and of these, 1,863 were government institutions. Short-stay hospitals had a total of 1,066,611 beds in 1986, or 4.1 beds per 1,000 civilian population, a decrease from 4.5 beds per 1,000 population in 1980. The combination of a few percentage points decline in community hospital admissions with a reduction in the average length of inpatient stay, led to a sharper reduction in average occupancy rates—from 72.2% in 1983 to 63.4% in 1986. The decline in inpatient volume was especially pronounced for small, mostly rural hospitals.

There are differences in hospital usage among various population subgroups. In 1987, blacks were hospitalized somewhat more frequently (117.4 discharges per 1,000 population) than whites (94.8 discharges per 1,000 population); blacks also had a somewhat longer average length of stay than whites (8.0 days vs. 6.6 days). The rural population (those outside of metropolitan statistical areas) is more frequently hospitalized (109.2 discharges per 1,000 population vs. 92.9 for residents of metropolitan areas), but their average length of stay is shorter (5.8 days vs. 7.1 days). Rates of hospitalization and average length of stay vary inversely with income, the former to a marked degree. In 1987 the population with a family income of less than \$US10,000 had a discharge rate of 143.7 per 1,000, while those with family incomes of \$US35,000 or more had a rate of 77.1.

Outpatient visits in short-stay hospitals increased by 30 million, from 255 million in 1980 to 285 million in 1986. Much of this trend toward providing services other than in hospital inpatient settings was driven by two forces: the change from cost-based reimbursement to prospective payment by the federal Medicare program, the nation's largest payer of medical care, and new developments in technology, which allow procedures such as cataract surgery to be safely performed in an outpatient setting.

The U.S. Department of Health and Human Services collects information on and assesses the quality of health-related goods and services. Drugs, blood supply, and laboratory diagnostic procedures are among the items closely regulated or monitored. States may, and often do, adopt inspection or regulatory procedures that supplement federal standards. Similarly, both federal and state governments inspect and regulate environmental health hazards.

Health Planning and Administration

The nation's capacity for health planning and management is distributed among federal, state, and local entities, including nongovernmental ones. The states are the principal governmental body responsible for health activities, and they, in turn, have delegated responsibility for some health-related efforts—particularly the direct delivery of health services—to local entities. All states have a policy development and planning function. Data collection occurs at federal, state, and local levels.

The federal government directly supports activities such as assessment, policy-making, resources development, knowledge transfer, financing, and some delivery of personal health care. Some of its major efforts include the conduct of surveys regarding the public's health status and health needs; biomedical, clinical, and health services research; regulation and inspection of foods and drugs; and technical assistance to state and local health systems. It also indirectly supports most service programs through contracts with states, localities, and private organizations.

Most of the federal resources to the states are block grants which the states use to support activities based on their own needs and priorities. The main body responsible for the administration of these health activities is the state health agency. State health agencies vary in breadth of responsibility and placement within the state government. These agencies, with additional direction from the federal government, state legislature, and outside groups, set policy for health-related issues.

The nearly 3,000 local health agencies vary in size and responsibility, but mainly provide preventive health services such as communicable disease control, restaurant inspections, food- and water-borne disease investigation, etc. Their funding comes mainly from state and federal program grants.

Other entities involved in health planning, research, and policy development include professional organizations, nonprofit organizations formed around specific health issues or diseases, organizations formed to represent specific citizen groups, and foundations which support health research and programs. These groups seek to influence or support specific health issues through political action, focusing public attention and financing health efforts.

An important example of a planning effort which brings together these various entities has been the *Objectives for the Nation—1990* and the current development of the *Year 2000 National Health Objectives*, which identify achievable goals for the nation in specific priority areas. Although these were developed at the national level, the federal government has worked and continues to collaborate with those involved in the health field at all levels within and outside of government to develop

and monitor these objectives. These objectives have served as a planning tool at the national level and as a guideline for state health agencies in setting priorities at their level. As of 1985, 84% of the states had set their own objectives based on national objectives in at least some of the areas. Further, 13% of the 1990 national objectives have already been achieved and 35% should be achieved by 1990. Work on the "Year 2000" objectives will build on the efforts that currently exist and focus greater attention on state efforts in priority areas.

Human Resources

Human resources for the provision of health services are, in general, sufficient to meet the health care needs of the country's population. Licensing is required for the majority of health professions. Since 1970, the number of active physicians has increased by 245,000 to 571,000 in 1988, or to 233 per 100,000 population. Further increases are projected: by the year 2000, there will be 708,000 active physicians, or 264 per 100,000 population. The country's medical schools graduate 16,000 physicians per year.

Despite increases in medical school enrollments to a peak of 167,327 in 1983, a significant amount of the increased physician supply came from graduates of medical schools outside the United States and Canada. The number of these foreign medical graduates (FMGs) grew from 54,400 in 1970 to 107,400 in 1986. In 1986, the 3,000 licenses issued to FMGs accounted for 15% of the 16,600 licenses issued. Not all FMGs obtaining U.S. licenses have remained here; however, data on the numbers returning to their country of origin are not available. Conversely, many FMGs are U.S. citizens who received training overseas because of inability to train at a medical school in this country. In 1983, the greatest number of foreign-born FMGs were from India (17,991), the Philippines (13,752), Mexico (7,720), Italy (4,465), South Korea (4,446), and Spain (3,712).

The active supply of U.S. dentists was 147,300 in 1988; this number is assumed to be in balance with current requirements. The current supply represents a 44% increase from 1970 figures. The dentist-to-population ratio is 59 dentists per 100,000 population. The number of dental graduates grew from 3,775 in 1971 to 5,371 in 1982; it is now decreasing and expected to stabilize at about 4,000 in 1990.

The total number of licensed registered nurses in 1988 was more than two million, of which an estimated 1,627,000 were employed in nursing positions. Even so, the current needs of acute care hospitals are not being met in many communities. In 1986–1987, the graduation of new nurses was 70,500 annually, 3,500 fewer than in

1981–1982. Thirty percent of graduates had completed a four-year college program. In 1986, 4,600 nurses from other countries came to the United States: 1,900 were from the Philippines; 350 from Canada; and fewer from other countries.

Other health occupations which require increases include rehabilitation occupations, such as physical and occupational therapy, clinical laboratory technology, and some public health specialties.

Having always constituted the majority of nurses, women have greatly increased their representation in other health professions and health profession schools. In medical schools, they comprised 36.5% of admissions in 1987, up from 11% in 1970. One-third of dental students are women, as are 58% of pharmacy and veterinary medical students.

HEALTH AND THE ENVIRONMENT

From an infectious disease perspective, the quality of the country's drinking water is generally very good; only rarely are outbreaks of enteric illness traced to a water-borne source. However, contamination of groundwater with manmade chemicals is increasingly widespread. The most ubiquitous groundwater contaminants are volatile halogenated organic hydrocarbon solvents, generally found at low concentrations. Although the acute toxicity of small quantities of these compounds is low, many of these substances test positive in animal carcinogenicity bioassays, and where these compounds have been discovered in drinking water, steps are taken to limit human exposure. Even more disturbing are recent findings of pesticide residues in the groundwater and surface water of many parts of the country. A federally sponsored survey of sources of potentially potable water is in progress

to better assess the extent of chemical contamination of the water supply.

Although not all sewage treatment systems in the U.S. are optimal from an environmental point of view, rarely does inadequate sewage treatment result in cases of infectious disease. Nevertheless, current sewage treatment practices may not adequately address chemical contamination in incoming wastewater, and, as a result, environmentally significant chemical contamination may persist in the effluent from sewage treatment plants and may be transferred to the surface water bodies where these effluents are discharged.

The great bulk of solid waste in the United States is disposed of in landfills, with relatively small amounts being recycled or incinerated. Nevertheless, many areas are turning toward incineration as a way to deal with solid waste because of the high cost of landfill disposal and other factors. The location of new incinerators has generated public controversy and concern because of the possible adverse health effects of toxicants (e.g., heavy metals) that may be released from some incinerators.

Lead toxicity is an important environmental health concern. Children living in older buildings in poor inner-city areas are at particularly high risk. A recent report by the Agency for Toxic Substances and Disease Registry estimated that 200,000 children had lead levels above 25 µg/dl in 1984, the level at or above which a child is considered to have lead poisoning. The problem of lead toxicity in children is likely to be targeted for further special attention in the nation's Year 2000 Health Objectives, which are currently being developed.

Although the country's air quality has greatly improved since 1970, air pollution remains a significant problem. From 1985 through 1987, the national standard for ozone was exceeded in 68 air quality reporting areas and the carbon monoxide standard was exceeded in 52 areas.

URUGUAY

GENERAL CONTEXT

Political, Economic, and Social Situation

The 1985–1988 period was a time of transition and adjustment. Freedoms were regained, and a civilian government apparatus once again began functioning with the difficulties that this implies, primarily by introducing changes to projects and procedures that had been in place for 15 years or more. Although a National Development Plan has not yet been prepared, a minimum government plan, called the National Programmatic Reconciliation, was adopted by representatives of all the political parties and social organizations before the current period of government began. The National Health System proposed by the reconciliation plan was not established, and the project to establish a National Health Insurance program that was submitted to Parliament by one of the parties was never discussed.

The economic crisis that has affected Uruguay as it has the other countries of the Region, began during the 1981–1984 quadrennium. Compared with those of the previous period, economic indicators for 1985–1988 seem good; the rapid economic growth of 1986–1987 tended to level out in 1988. Table 1 presents data from the Economic Commission for Latin America and the Caribbean (ECLAC) on trends in total gross domestic product (GDP) and per capita GDP. The data indicate that despite the recovery of 1986 and 1987, the cumulative change for the two quadrennia is still negative. From 1982 to 1988, changes in the per capita GDP

showed positive values only for 1986 and 1987. The brief improvement period is cause for concern, especially considering that 1982 was not the first year in which the Uruguayan economy deteriorated.

The country's external debt continues to grow; by 1988 it came to \$US6.05 billion. The percentage of export earnings earmarked for the debt service has increased markedly, peaking in 1985 at 47.8%. During 1981–1984, exports and imports declined, with a negative price ratio, while in 1985–1988, exports began to increase in 1986, as did imports, with an overall positive balance.

The Central Government's expenditure as a percentage of the GDP has remained relatively constant. The percentage of public spending on health has increased from 4.1% in 1982, to 5.4% in 1983, 4.3% in 1984, 5.3% in 1985, 6.7% in 1986, and 6.2% in 1987.

From 1981 to 1984, urban unemployment reached 14%, the highest level in the decade. In the 1985–1988 quadrennium it declined and has been accompanied by economic recovery. But the 9.2% figure for 1988 is still unacceptable in terms of figures seen historically in Uruguay. These figures do not include underemployment, which is significant. There is no major difference by age, but there is by sex, because unemployment is always greater among women. The highest unemployment rates are in construction, manufacturing, and commerce.

Real wages increased from 1985 to 1988, although they have not completely recovered (from 1968 to 1987 they dropped 50%). The real increases for each of the years included in this period were 14.1%, 6.7%, 4.8%, and 2.3%, respectively. Consumer prices have increased 60% to 80% annually.

| | Annual rates of growth | | | | | | | Cumulative change 1981–1988 |
|-------------------|------------------------|------|------|------|------|------|------|--------------------------------|
| | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | |
| GDP | -10.1 | -6.0 | -1.3 | 0.2 | 7.0 | 5.3 | 0.0 | -4.4 |
| Per capita GDP | -10.7 | -6.6 | -2.0 | -0.6 | 6.3 | 4.5 | -0.8 | -9.8 |

Source: ECLAC, Notes on the economy and development, No. 470/471, December 1988.

According to data from the last national census, conducted in 1985, illiteracy was 4.3%; it was greater in women than men, and the difference was greater in rural areas.

There was an increase of 119,209 private housing units from the 1975 census to the 1985 census. In urban areas the increase was 17%, while in rural areas there was a 12% decline. Of all housing units, 75.2% had one to four occupants, while 24.8% had five or more. Of the housing units included in the 1985 census, 1.3% were built with waste materials or were located in buildings not meant to be used for housing.

A study on basic needs in Uruguay, conducted by the General Bureau of Statistics and Census and published in December 1988, shows the results of a study on living conditions based on the 1985 census. The results are broken down by city neighborhoods and by settlements or smaller divisions in the various departments. The study found that 22.1% of all households had unmet basic needs. Montevideo was the department with the lowest percentage (14.6%), while four departments (Artigas, Cerro Largo, Rivera, and Tacuarembó) had percentages of approximately 40% each.

In Montevideo the critical housing shortage is due primarily to overcrowding. In the interior the most critical unmet need is in sanitary services; the second and third most pressing needs are overcrowding and water supply. Access to the educational system has little impact on the index of unmet basic needs in both Montevideo and the interior.

Demographic Characteristics

According to the last census (1985), the total population was 2,955,241: 1,311,976 (44.4%) lived in the Department of Montevideo and 1,643,265 (55.6%), in the interior. The urban population came to 2,581,087 and accounted for 87.3% of the total. If these data are compared with results from the 1975 census, it becomes clear that not only did the percentage of rural dwellers drop, but that rural areas also were depopulated—the total number of rural inhabitants decreased from 474,100 to 374,150 (21.1%). It is difficult to quantify how much of the rural population moved to population centers and how much emigrated from the country. Population increases were very uneven by geographic area. For example, in the central part of the country, which is characterized primarily as a cattle zone, there was a net decline in population. The male-female ratio ranges from 86 males for every 100 females in Montevideo to 181 males per 100 females in the rural area of Durazno.

Projections indicate that from 1980 to the year 2000 the population will grow only 12.4%, which is equivalent

to an annual growth rate of 0.585%. The male-female ratio fell from 102:100 in 1950 to 97:100 in 1980; by the year 2000, it is expected to drop to 95:100. Changes in the age structure of the population can be noted both in the decline of the population under 5 years of age (from 9.5% to 8.1%) and in the increase in the population 65 years and over (from 10.5% to 12.7% in the same period). In addition, population changes vary by sex: by the year 2000 the percentage of women 65 years and over will be 14.5%, while for men it will be 10.7%.

Fertility, which declined in the first half of the century, held steady from 1950 to 1975, and then began to decline once again. Both the census data and the number of births registered in 1985–1988 suggest it will be difficult to reverse this trend. In the document entitled "Uruguay: Population estimates and projections by age and sex, country totals, 1950–2025" (General Bureau of Statistics and Census, March 1989), the following possible explanation is given for changes in fertility: "Outside of historic trends, it should be noted that this reduction appears to reflect changes in the composition of the family that are manifested in lower rates of marriage and in an increase in the relative weight of consensual unions. At the same time, there is a decline in legitimate births (births in marriages)."

Estimates indicate that this trend reflects declines in the crude and net reproduction rates that approach replacement levels, which would point to a greater aging of the population. The net reproduction rate was estimated at 1.14 for 1985–1990.

Emigration from Uruguay in the last 20 years was not uniform: some periods had many emigrants, some had fewer, and others were stable. There is not enough available information to define these periods or the principal characteristics of the migratory flows. During the interval between censuses, some emigrants returned and other immigrants, mostly children born abroad to returning emigrants, came with them.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

It is believed that 100% of all deaths in the country are registered. The Civil Register dates to 1879 and covers the entire national territory through 230 local offices. Of all births, 96% are delivered in hospitals, and 99% are certified by a physician or a midwife with university training. Underregistration of births is very low (2%–3%).

In 1985, 100% of all deaths were medically certified. Such high coverage can be maintained because of the country's characteristics, its services system, and its many physicians, who, although they are mostly concentrated in the capital, still serve the interior in large numbers. There are 2.2 physicians per 1,000 population.

The crude death rate has been approximately ten deaths per 1,000 inhabitants since 1950. As the population has aged, the real decline in mortality is not reflected in the crude rate. According to projections, this rate will remain fairly steady.

In the early 20th century, life expectancy at birth already had reached 50.8 years, and it increased to 68.5 in 1963–1964; then came a decade of stagnation, and by 1974–1976 the figure rose only to 68.9 years. Later it increased significantly, and by 1984–1986 it had climbed to 71.6 years (74.9 for females and 68.4 for males).

Bearing in mind that infant mortality dropped to 21 deaths per 1,000 live births in 1988 and that child mortality in other age groups also fell, it is possible to forecast that by 1990 life expectancy at birth will be 70 years for males, 76 for females, and 73 for the population as a whole.

Table 2 shows the structure of mortality for the entire population, by sex and age group, in 1980, 1984, and 1987. A proportional decline can be seen in the first three age groups (under 5, 5–44 years, and 45–64 years), while the last (65 and over) has increased, reflecting aging of the population. Percentages are always lower in women under 65 years old. The twofold effect of aging and greater male mortality means that by 1987, of every four women who die, three were 65 years and older.

In 1985, 7.2% of deaths were attributed to signs, symptoms, and ill-defined conditions (10.0% in Montevideo and 4.4% in the interior). Montevideo's higher percentage is thought to be linked to sudden deaths whose cause cannot be determined and which are certified as such or are referred to a medical examiner; deaths at

home, many of which are terminal patients who have been discharged from a hospital and whose deaths are passed on to the medical examiner because they were not certified by an attending physician; and hospital deaths of patients with undetermined diagnosis that are either registered as having an unknown cause or are referred to the medical examiner. In most cases, the examiner merely confirms the death and its nonviolent nature. In the interior's less populated areas, where people know one another better, an attending physician usually is present to fill out the certificate.

More than 80% of death certificates identify two to three causes. A rectification system has been maintained for decades, whereby additional data are requested from physicians who fill out incomplete or questionable certificates. A recent nationwide study compared a sample of death certificates for deaths in public and private hospitals nationwide with the respective clinical histories, in order to determine the degree of correspondence between the diagnoses contained in the two documents. The results showed that in 75% of the cases the data in the death certificate agree with those in the clinical history. In 14.4% of the cases there was no agreement, but there was a trend to attribute the basic cause of death to residual categories of the same chapter of the *International Classification of Diseases*; consequently, the structure by cause of mortality was not substantially affected.

Diseases of the circulatory system are a leading cause of death (Table 3), especially in women, though throughout the period analyzed, its percentage changed little. Neoplasms of all types continue to increase in importance as causes of death, especially in men. A clear difference by sex is observed in deaths due to accidents and violence: the percentage of male deaths from these causes is twice that of female deaths. There is a clear reduction in deaths due to diseases associated with early infancy (congenital and perinatal), which fell from 4.3% in 1980 to 3.0% in 1987.

| Age (years) | 1980 | | | 1984 | | | 1987 ^a | | |
|-------------|-------|------|------|-------|------|------|-------------------|------|------|
| | Total | M | F | Total | M | F | Total | M | F |
| Under 5 | 7.6 | 7.7 | 7.5 | 6.1 | 6.1 | 6.0 | 5.1 | 5.2 | 4.9 |
| 5–44 | 7.0 | 8.0 | 5.9 | 6.1 | 7.0 | 5.1 | 6.4 | 7.3 | 5.2 |
| 45–64 | 22.2 | 26.7 | 16.6 | 21.4 | 26.1 | 15.7 | 20.7 | 25.3 | 15.3 |
| 65 and over | 63.2 | 57.6 | 70.1 | 66.4 | 60.8 | 73.2 | 67.9 | 62.2 | 74.7 |

^aProvisional data.

TABLE 3
Proportional mortality by groups of causes, by sex, Uruguay, 1980, 1984, and 1987.

| Cause | 1980 | | | 1984 | | | 1987 ^a | | |
|--|-------|------|------|-------|------|------|-------------------|------|------|
| | Total | M | F | Total | M | F | Total | M | F |
| Circulatory system (390-459) | 40.7 | 37.3 | 44.9 | 41.8 | 38.2 | 46.3 | 41.2 | 37.7 | 45.2 |
| Neoplasms (140-239) | 20.3 | 20.7 | 19.7 | 21.6 | 22.9 | 20.1 | 22.3 | 24.2 | 20.6 |
| Infectious and parasitic diseases; nutritional deficiencies; acute respiratory infections; influenza, pneumonia, and meningitis (001, 139, 260-269, 460-466, 480-487, 320-322) | 5.7 | 5.5 | 6.1 | 5.5 | 5.3 | 5.9 | 5.1 | 4.4 | 5.9 |
| Other chronic and/or degenerative diseases (diabetes, ulcers, cirrhosis, bronchitis, emphysema, asthma, nephritis, nephrosis) (250, 531-535, 571, 490-493, 580-589) | 6.3 | 6.9 | 5.6 | 6.1 | 6.5 | 5.6 | 5.7 | 6.0 | 5.5 |
| Accidents and violent acts (accidents and adverse events; homicides, suicides, etc.) (E800-E999) | 6.7 | 8.6 | 4.3 | 5.2 | 6.7 | 3.4 | 6.0 | 7.7 | 3.9 |
| Congenital anomalies and conditions originating in the perinatal period (740-779) | 4.3 | 4.4 | 4.1 | 3.3 | 3.3 | 3.1 | 3.0 | 3.1 | 2.8 |
| Other well-defined causes | 8.8 | 8.7 | 9.0 | 9.2 | 9.4 | 8.9 | 10.4 | 10.5 | 10.3 |
| Signs, symptoms, and ill-defined conditions (780-796) | 7.3 | 8.0 | 6.4 | 7.3 | 7.8 | 6.7 | 6.2 | 6.4 | 5.9 |

^aProvisional data.

Health Situation of Specific Population Groups

Child Health

In 1988 the infant mortality rate was 20.9 per 1,000 live births (1,078 deaths); in 1980 it was 37.6 per 1,000 (2,024 deaths), representing a reduction of almost half in the past decade.

Table 4 shows the infant mortality figures for 1980 to 1988, broken down by components (neonatal, postneonatal, fetal, and early neonatal), as well as figures on maternal mortality. Throughout the period, there has been a clear decrease in neonatal and postneonatal mortality, particularly in the latter. The most recent figure for postneonatal mortality is 9.5% in 1987, which indicates that it is still possible to reduce infant mortality further. In neonatal mortality the reduction has been primarily in deaths in the first week (early neonatal). The trend for maternal mortality has been very similar to that of infant mortality. In 1987, 14 maternal deaths were registered.

Table 5 illustrates the changes that occurred from 1985 to 1987 in infant mortality broken down by component (neonatal and postneonatal), by institution (Ministry of Public Health, mutual organizations, and private sector), and for Montevideo and the interior. These data suggest that the changes in those years were due mainly to a drop

in the rate of public sector service beneficiaries, from 43 per 1,000 live births to 34 per 1,000. However, the possibility of a further reduction in infant mortality in the country can be gauged by observing that in 1987 the figure stood at 12.7 per 1,000 for mutual organizations and for sanatoriums, which serve more than 50% of the population nationwide, while for the public sector it was 34 per 1,000. Socioeconomic differences could be a determining factor, since perinatal and infant mortality are 3 to 9 times higher for the population using Ministry services than for that using private institutions.

Table 6 shows total deaths of children under 1 year old and the rates per 1,000 live births by cause, for 1980, 1984, and 1987. There was a noteworthy reduction of deaths due to intestinal infections (diarrhea), from 202 in 1980 to 23 in 1987. The Ministry's campaign, which involved work with the diarrhea control program, educational activities, and the distribution of oral rehydration salts, has probably been the reason for this success. There was also a clear reduction in deaths from diseases originating in the perinatal period. The third cause group, lagging far behind the two previously mentioned causes, is respiratory diseases (acute respiratory infections, influenza, and pneumonia). The other causes have varied little; external causes (accidents and violence) worsened.

Of 53,766 live births in 1985, 4,248 had birthweights lower than 2,500 g (7.9%), and 4,118 had birthweights greater than 4,000 g (7.6%).

| Year | Infant | Neonatal | Postneonatal | Perinatal | Fetal | Early neonatal | Maternal ^a |
|-------------------|--------|----------|--------------|-----------|-------|----------------|-----------------------|
| 1980 | 37.6 | 22.6 | 15.0 | 32.9 | 14.3 | 18.6 | 5.0 |
| 1981 | 33.4 | 19.6 | 13.8 | 30.4 | 14.2 | 16.2 | 6.1 |
| 1982 | 29.9 | 18.7 | 11.2 | 28.8 | 13.6 | 15.2 | 3.7 |
| 1983 | 28.6 | 17.7 | 10.9 | 28.6 | 14.5 | 14.1 | 3.9 |
| 1984 | 30.1 | 17.8 | 12.3 | 26.5 | 13.0 | 13.5 | 3.7 |
| 1985 | 29.3 | 17.1 | 12.2 | 25.7 | 12.5 | 13.2 | 4.3 |
| 1986 | 27.7 | 15.6 | 12.1 | 23.5 | 11.8 | 11.7 | 4.0 |
| 1987 | 23.8 | 14.3 | 9.5 | 23.5 | 12.4 | 11.1 | ... |
| 1988 ^b | 20.9 | ... | ... | ... | ... | ... | ... |

^aRate per 10,000 live births.

^bProvisional data.

Mortality in the 1–4-year-old age group also has diminished; there were 240, 212, 184, and 187 deaths in 1980, 1984, 1985, and 1986, respectively. According to the final figures of the 1985 census, the rate that year was 8.96 per 10,000 children in that age group.

It is difficult to obtain precise information on the nutritional status of the overall population, since most studies include only the population covered by the Ministry of Public Health, which serves the lower income sectors. Furthermore, nutrition had not constituted a problem because of the redistributive policies that were in effect

for several decades. In the 1970s and the early 1980s there was a significant concentration of income, and the percentage of the population below the poverty line increased (from 9.4% for Montevideo in 1963 to 25% in 1984). According to data from the world food survey conducted by FAO in 1985, per capita availability of food energy diminished 0.5% from 1969–1971 to 1979–1981, dropping from 2,982 calories/day in the first period to 2,834 in the second.

According to information on the incidence of malnutrition in Montevideo from 1980 to 1985, gathered by

| Geographical area and component | All institutions | | Ministry | | Mutuals and sanatoriums | |
|---------------------------------|------------------|------|----------|------|-------------------------|------|
| | 1985 | 1987 | 1985 | 1987 | 1985 | 1987 |
| Country total | 29.4 | 23.8 | 43.0 | 34.0 | 13.8 | 12.7 |
| Less than 4 weeks | 17.3 | 14.4 | 25.0 | 21.8 | 11.2 | 9.3 |
| 4 weeks–11 months | 12.1 | 9.4 | 18.0 | 12.2 | 2.6 | 3.4 |
| Montevideo | 23.5 | 19.9 | 50.3 | 33.7 | 12.3 | 12.7 |
| Less than 4 weeks | 13.6 | 11.4 | 26.6 | 20.6 | 10.0 | 8.8 |
| 4 weeks–11 months | 9.9 | 8.5 | 23.7 | 13.1 | 2.3 | 3.9 |
| Interior | 35.8 | 27.9 | 44.8 | 34.2 | 15.1 | 12.8 |
| Less than 4 weeks | 21.4 | 17.5 | 27.5 | 22.4 | 12.3 | 9.9 |
| 4 weeks–11 months | 14.4 | 10.4 | 17.4 | 11.8 | 2.8 | 2.9 |

^aTotal deaths of children under 1 year came to 2,024 in 1980, 1,605 in 1984, 1,579 in 1985, 1,502 in 1986, 1,275 in 1987, and 1,078 in 1988 (provisional data). The number of live births in those years ranged from 53,400 to 53,900. The figures are per 10,000 live births.

Source: Statistical Division, Ministry of Public Health, Uruguay, 1989.

| Causes | 1980 | | 1984 | | 1987 ^a | |
|--|-------|-------|-------|-------|-------------------|-------|
| | No. | Rate | No. | Rate | No. | Rate |
| All causes | 2,024 | 37.60 | 1,604 | 30.10 | 1,275 | 23.80 |
| Intestinal infections | 202 | 3.75 | 145 | 2.72 | 23 | 0.43 |
| Septicemia | 28 | 0.52 | 47 | 0.88 | 24 | 0.45 |
| Diseases preventable by vaccination ^b | 4 | 0.07 | — | — | 9 | 0.17 |
| Nutritional deficiencies | 78 | 1.45 | 76 | 1.43 | 78 | 1.46 |
| Diseases of the nervous system | 51 | 0.95 | 39 | 0.73 | 31 | 0.58 |
| Respiratory infections, influenza, pneumonia | 113 | 2.10 | 78 | 1.46 | 70 | 1.31 |
| Congenital anomalies | 214 | 3.98 | 218 | 4.09 | 195 | 3.64 |
| Perinatal conditions | 990 | 18.39 | 698 | 13.10 | 606 | 11.31 |
| Accidents and violence | 33 | 0.61 | 59 | 1.11 | 53 | 0.99 |
| Other well-defined causes | 125 | 2.32 | 90 | 1.69 | 85 | 1.57 |
| Ill-defined causes | 186 | 3.46 | 154 | 2.89 | 101 | 1.89 |

^aProvisional data.

^bTuberculosis, diphtheria, whooping cough, poliomyelitis, measles, and rubella.

the Epidemiological Surveillance System from six health centers of the urban periphery serving a high-risk population, 39% of the children under 5 years old were malnourished according to the weight/age criterion used in the population served by the Ministry.

In 1987, the National Institute of Nutrition and Primary Education carried out a height/age census among first-grade children in all the country's public schools (more than 85% of all children). The census revealed that this ratio was under 1 standard deviation in 20% of the children and under 2 standard deviations in 4%. Of these children, 75% were in 21% of the schools, clearly suggesting the areas with the greatest deficiencies. The deterioration of the population's nutritional status may be related to the increase in the cost of the family food basket, whose value has exceeded the minimum wage since 1980.

In 1988, 25 deaths from diarrhea were registered in children under 1 year old (of 54,728 births); in all, there were 9,417 cases (4,424 in Montevideo and 4,993 in the interior). The program for control of diarrheal diseases using oral rehydration therapy guaranteed the annual production and distribution of salts; 30,350 packets were produced in 1983, and 517,000 packets in 1988.

Acute respiratory infections are the leading causes of consultation in the health centers and polyclinics, and the sixth leading cause of discharges from Ministry establishments for children under 1 year old.

Regarding diseases preventable by vaccination, from 1984 to 1988, 2,144 cases of whooping cough were reported (25 in 1988) and 1,912 cases of measles (76 in 1988). No cases of poliomyelitis, neonatal tetanus, or diphtheria were registered. Since 1 January 1987, the Honorary Commission for the Campaign Against Tuberculosis has operated a system for computerized registration of all newborns that makes possible the control, surveillance, and follow-up of each newborn, as well as the monthly coverage and the coverage by department. Immunization coverage in children under 1 year old in 1986, 1987, and 1988 was as follows: 96%, 98%, and 99% for BCG; 70%, 78%, and 83% for DPT (third dose); and 65%, 78%, and 83% for poliomyelitis (oral, third dose), respectively.

Health of Adolescents

Even though adolescent pregnancy does not reach high levels, it constitutes a problem and shows differences according to socioeconomic level. Of all deliveries in 1985, 12% were to mothers 15 to 19 years of age. This group has a fertility rate of 57 per 1,000. (Only three of every 1,000 births in 1985 were to mothers under 15 years of age.) Of the 6,442 live births to mothers 15 to 19 years of age in 1985, 12% had a birthweight lower than 2,500 g, a much higher percentage of birthweight under 2,500 g than was observed for all live births.

During 1985–1986, several research projects were carried out on the use of tobacco, alcohol, barbiturates, and amphetamines by adolescents 12 to 18 years old of both sexes. The results indicated that 30% to 40% had some type of addiction, primarily to alcohol and tobacco.

The age group 15 to 24 years old had death rates of 96.9 per 100,000 in men and 45.5 per 100,000 in women, revealing the significant difference in mortality by sex, which is particularly accentuated in this age group (240 male deaths and 110 female deaths). The excess of mortality in males occurs not only with accidents and violent acts (153 male deaths and 43 female deaths), but also holds for other causes (neoplasms, diseases of the heart, respiratory diseases).

Adult Health

Death rates increase with age, and in this age group there is also a relative excess of male mortality. Table 7 shows the death rates per 100,000 inhabitants by sex and age groups for 1986.

The three leading causes of death in the age group 25 to 64 years old are the same for Montevideo and for the interior: diseases of the circulatory system, neoplasms, and accidents. In 1986, diseases of the circulatory system, which constitute the leading cause of death nationwide, caused 1,501 deaths in males and 728 in females, accounting for 31.1% and 28.4%, respectively, of total deaths in that group.

Table 8 presents the death rates in 1986 for diseases of the circulatory system, malignant neoplasms, and accidents and violence (E47–E56), by age groups.

The five leading causes of death in the group of diseases of the circulatory system in 1986 were ischemic heart disease; cerebrovascular diseases; diseases of pulmonary circulation; other forms of heart disease; and arteriosclerosis and other diseases of the arteries, arterioles, and capillaries. The death rates from cerebrovascular diseases are much higher in Montevideo than in the interior.

The most common sites of malignant neoplasms among those who died from this cause were: trachea, bronchia, and lung; colon; breast (in women); stomach; and prostate. The leading causes of death within the group of accidents and violence (E47–E56) for persons

| Sex | Age (years) | | | |
|---------|-------------|-------|-------|---------|
| | 25–34 | 35–44 | 45–54 | 55–64 |
| Males | 147.9 | 291.9 | 743.4 | 1,912.5 |
| Females | 94.9 | 201.4 | 375.6 | 858.0 |

| Cause | Age (years) | | | |
|------------------------|-------------|-------|-------|-------|
| | 25–34 | 35–44 | 45–54 | 55–64 |
| Circulatory system | | | | |
| Males | 14.6 | 65.4 | 214.1 | 664.4 |
| Females | 16.1 | 32.2 | 105.6 | 272.6 |
| Malignant neoplasms | | | | |
| Males | 15.6 | 52.5 | 233.3 | 632.7 |
| Females | 26.9 | 78.8 | 154.1 | 319.1 |
| Accidents and violence | | | | |
| Males | 79.3 | 85.2 | 77.7 | 104.1 |
| Females | 21.5 | 24.7 | 17.4 | 39.5 |

25 to 64 years old are: motor vehicle traffic accidents, suicides, drowning and suffocation, falls, and homicides.

Since 1963, the Department of Oncology has kept a register of neoplasms, whose analysis suggests the following conclusions. In 2,612 cases with histological diagnosis analyzed for 1983–1985, there was a high frequency of lung cancer in males (19.8%) and of breast cancer in females (29.2%). These are followed by neoplasm of the colon and rectum, (14.2% in men and 12.4% in women). In men there is a clear predominance of tobacco-related neoplasms (44.6%) and in women, neoplasms of the sexual organs (53.1%).

Of 3,450 women over 25 years old (average age, 57.4 years) examined in 1985, 20 cases of breast cancer were diagnosed; 90% were in the initial stages and two cases were at stage III. In 1985, the incidence of breast cancer at the Medical Assistance Center of Uruguay (CASMU), based on the conventional methods, was 1.6 per 1,000 women over 25 years old. The incidence found in the program, for the same age group, was 5.8 per 1,000. The highest specific rates, except for persons over 70 years old, were in those 45 to 49 years old (with 12.3 per 1,000) and in those 55 to 59 years old (7.1 per 1,000).

Health of the Elderly

In 1985, the age group 65 years old and older constituted 11.5% of the population; 58% were women. In Uruguay, the elderly tend to live alone or in homes or institutions devoted to their care but that have serious shortcomings.

The Social Security system covers 743,337 people (24.7% of the national population), 383,607 of whom are retirees and 359,730, pensioners. It is possible that these figures conceal duplications, such as those that may

exist among the beneficiaries of the "public" and professional pension funds.

According to data from the General Bureau of Statistics and Census, of the 334,907 retirees covered by the Bank of Social Welfare in 1987, 289,119 (86.3%) were 60 years and over; of the 194,563 pensioners, 86,851 (44.6%) were in that same age group. A total of 75% of the retirees and 97% of the pensioners received pensions of up to \$US100, which is not enough to cover their needs. It should be pointed out that those persons whose medical care is covered through the Social Security system while they are economically active lose this benefit once they retire.

Of all deaths, 66% occur in the age group 65 years old and over. The leading cause of death in this group is cardiovascular disease, accounting for 48.6% of the deaths. Of these, acute myocardial infarction and other ischemic heart diseases constitute the largest cause group (31.9%). Malignant neoplasms cause 22% of the deaths in this group; the most frequent sites are the lung in men and the breast in women. Respiratory diseases (bronchitis, asthma, emphysema, and others) constitute the third leading cause of death; their incidence in men is more than double that in women.

Health of Women

According to the 1985 census, women constituted 51.2% of Uruguay's population; 12.3% are 65 years old or older, as compared to 9.5% of men. The country's overall fertility rate was 2.7 children per woman, ranging from 2.3 in Montevideo to 3 in the rest of the country. Important among the causes of the declines in fertility and birth rate are the increase in women's educational levels and the growing incorporation of women into the labor market, especially since the crisis of the 1980s. In 1975 the rate of female participation was 27.7%; this figure rose to 32.4% in 1985.

Since family planning services are limited, it is estimated that many contraceptives are used without the control needed to avoid potential risks to health. Furthermore, despite the fact that there are no precise data on abortions, since they are illegal, the most conservative estimates indicate that there are at least as many abortions as births.

The three leading causes of death for women are cardiovascular diseases, neoplasms, and accidents. Among neoplasms, the decline in the incidence of cancer of the cervix and the high incidence of breast cancer are striking. Maternal mortality was discussed in the section on child health (see Table 4).

Occupational Health

By law all private companies must register their workers in the State Insurance Bank, which in addition to

economic benefits provides medical care in cases of work-related accidents and occupational disease. There are 400,000 insured workers.

Problems Affecting the General Population

Oral health is one of the most critical areas in Uruguay's health system. On the one hand, there is a high prevalence of dental caries (98% of the overall population), periodontal diseases (78%), diseases of the soft and hard tissues (25%), and neoplasm of the oral cavity (approximately 15%); on the other, mass prevention programs (fluoridation, for example) are scanty. Human resources are concentrated in the large cities (76% of the 3,035 dentists are in Montevideo), and there is a shortage of auxiliary personnel.

There is a significant underregistration of sexually transmitted diseases. From 1984 to 1988, 15,953 cases of syphilis, 16,900 cases of gonorrhea, and 27,033 cases of other sexually transmitted diseases were reported. Other sexually transmitted diseases increased from 15.6% in 1984 to 58.9% in 1988; on the other hand, syphilis declined from 38% to 22.6%, and gonococcal infections, from 46.4% to 18.5%. From 1983 to 1 March 1989, an accumulated total of 50 AIDS cases had been registered, with 29 deaths and 309 HIV positives.

The Chagas' disease vector is still found in the north, especially in rural areas. From 1984 to 1988, 379 cases were reported (98 of them in 1988). Hepatitis A is more frequent and endemic in areas with poor sanitary conditions; from 1984 to 1988, 10,242 cases were reported (4,539 in 1986).

There is a downward trend in the number of cases of tuberculosis, with 1,082, 1,023, and 900 cases reported in 1986, 1987, and 1988, respectively, which represent rates of 35.7, 33.5, and 29.4 per 100,000 population. A total of 131 deaths were registered in 1980 (6 in persons under 25 years old), 100 in 1985 (2 in persons under 25 years old), and 85 in 1986 (1 person under 25 years old). For 1985, the rates were 4.1 and 1.5 per 100,000 population for males and females, respectively.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

Characteristics of the Health Services Systems

The public sector is made up of the Ministry of Public Health, the General Bureau of Social Security, and other medical services that come under the Ministry of Interior, the Ministry of National Defense, the University of the

Republic (Clinics Hospital, School of Medicine), and the municipal governments, autonomous entities, and decentralized services. The private sector is made up of institutions for collective medical care (IAMC) and sanatoriums, convalescent homes, and noninstitutional private care facilities.

Table 9 shows the coverage of each of these sectors according to data from the Family Health Survey of 1984, updated for the mutual coverage by SINADI in 1988. In 1988, the IAMC covered 50.5% of the country's population; this coverage was 73.9% in Montevideo and 30.1% for the rest of the country. These figures, collected from the SINADI, may conceal the fact that many persons living in the interior may be affiliated with the Montevideo institutions.

The 1986 Law of Accountability (approved in 1987) created the Health Services Administration of the State (ASSE), which provides for the almost complete separation between the Ministry's medical services and its regulatory and control division. This has yet to be fully implemented, and several issues regarding responsibilities have not been clearly defined. The ASSE also coordinates with other health services, both public and private, and is studying the legal and administrative aspects of decentralization.

The Social Security system provides medical services through two channels: a) within the maternal and child health service, the Bureau of Family Affairs provides pregnancy control, delivery care, and monitoring of healthy children for working women and workers' wives; and b) within the comprehensive medical care, the Bureau of Health Insurance in Case of Disease provides medical care for workers affiliated with an IAMC. The latter modality has grown in recent years through the incorporation of new groups of workers; the total of 247,093 persons covered in 1983 increased to 471,948 in 1987.

| Subsector | Institution | Population covered (%) |
|-----------|---|------------------------|
| Official | Ministry of Health and Clinics Hospital | 28.5 |
| | Armed Forces and Police | 10.5 |
| | Other | 1.0 |
| Private | IAMC ^a (mutual services) | 50.5 |
| | Private hospitals and other direct payment services | 9.5 |

^aInstitutions offering collective medical care.

Source: Ministry of Public Health, 1988, and Family Health Survey, 1984.

Priority Policies, Plans, and Programs

In terms of health policies and programs, the Ministry emphasizes decentralization and local health systems, but actual operations have not been changed. The priority programs continue to be those in maternal and child health: monitoring of mothers and children, nutrition, immunizations, etc. In this period the Mental Health Program was created, with basically diagnostic activities. One of its main objectives is the deinstitutionalization of chronic patients. There are no programs for health of adults or for chronic diseases, even though these are some of the country's main health problems.

Installed Capacity and Health Services Production

The Ministry of Public Health has 8,948 beds, of which 5,289 are in Montevideo; 3,688 are in hospitals for long-term stays (care of chronic patients). In addition, there are 755 beds at the Clinics Hospital, which functions as part of the University; 430 at the Armed Forces Health Service; 136 at the Hospital of the Insurance Bank; and 83 at the Social Security hospital (only for obstetrics). The private sector has 2,345 beds in the mutual sector and 1,436 in the strictly private hospitals, some of which are actually used by the mutual sector.

Table 10 shows a series of indicators on the Ministry's services production in 1987. The number of discharges, 126,123, seems low in relation to installed capacity, especially considering that in the same period the IAMC had 160,000 discharges with fewer beds (although they subcontract with the private sector). The same table shows major problems in the efficiency of the Ministry's services. The percentage of occupancy in the interior is 51.9%. There is a major difference in the average length of stay between the establishments of Montevideo (38.8) and those of the interior (8.1). This could be partly explained by the concentration of long-term beds in Montevideo; but even so, the average for the hospitals that offer acute care is 15.0, which is considered very high.

In 1987 there were 50 private institutions that offered collective medical care (IAMC); of these, only 4 had more than 50,000 members, and all of these were located in Montevideo (with 39% of the total members nationwide and 58% of those in Montevideo). Since these institutions have the greatest installed capacity and are the most efficient, it can be inferred that a considerable percentage of their members reside in the interior, not in Montevideo.

By residence (Montevideo, interior) and by type of organization (mutual, cooperatives), the number of consultations per member in 1985–1987 was approximately

TABLE 10

**Indicators of the activities undertaken by Ministry of Public Health facilities
that offer hospitalization, Uruguay, 1987.**

| Place/ type | Daily average of available beds | % occupancy | No. discharges | | | Daily average | | Bed turnover | Average length of stay (days) |
|----------------|--|----------------|----------------|------------|--------|-----------------|-----------------|-----------------|--|
| | | | Total | Discharges | Deaths | Admis- sions | Dis- charges | | |
| Total | 8,826 | 70.2 | 126,123 | 121,035 | 5,088 | 348.8 | 345.8 | 14.3 | 17.9 |
| Montevideo | 5,163 | 83.2 | 40,352 | 38,202 | 2,150 | 114.6 | 110.6 | 7.8 | 38.8 |
| Acute | 1,913 | 78.1 | 36,312 | 34,563 | 1,749 | 106.8 | 99.5 | 19.0 | 15.0 |
| Chronic | 3,250 | 86.2 | 4,040 | 3,639 | 401 | 7.8 | 11.1 | 1.2 | 253.1 |
| Interior | 3,663 | 51.9 | 85,771 | 82,833 | 2,938 | 233.5 | 235.2 | 23.4 | 8.1 |

Source: Ministry of Public Health.

six per year; the number of hospitalizations also remained fairly steady (around 100 discharges per 1,000 members).

Given the number of hospitalizations in Ministry and IAMC institutions, which together come to some 280,000 discharges per year (which does not include the Clinics Hospital, the Armed Forces, the Police, other public services, or the private sector that requires direct payment for services), the annual volume of discharges would exceed 300,000. This means that hospitalizations nationwide would exceed 100 per 1,000 population per year.

Human Resources

Uruguay is one of the countries with the greatest density of physicians in the Region. In 1986 there was one physician for every 357 inhabitants, with a major concentration in the capital, which had one physician for every 192 inhabitants. The rest of the country had one physician per 1,125 population.

According to the register of active physicians of the Uruguayan Physicians Union, in 1989 there were 5,044 male and 3,470 female physicians. Since 1983, the number of women graduating as physicians has exceeded the number of men, and the distribution by sex of medical students would suggest that this trend will continue; by 1995 it is projected that there will be three men for every seven women graduating from medical school. Multiple employment is characteristic of physicians, and is due to the low pay and limited hours per week that the different subsectors require.

There is only one university-level Nursing School. The training of nursing auxiliaries is under the School of Health, which comes under the Ministry of Public

Health. However, there are several training centers, both in Montevideo and in the interior, whose quality varies.

There were 397 nurses with university training who stated that they worked as nurses, and 1,088 who stated that they did not. The number of nursing auxiliaries in the country is unknown.

The lack of university-trained nurses is one of the greatest obstacles to the operation of the health services; the situation is worse in the Ministry, which pays lower wages than the private sector and consequently is not a desirable employer for a category of personnel that is in short supply. The redefinition of the role of nursing has led to fewer nurses working directly with patients, as they increasingly carry out administrative functions.

The distribution of midwives in Montevideo and in the interior is similar, due to the different type of care for deliveries in the hospitals of the interior. The rest of the health personnel are trained by the School of Medical Technology, which is part of the University of the Republic, and by the School of Health, which comes under the Ministry.

The current economic crisis, and especially restrictions on public spending, has led to many vacancies in the Ministry for posts directly involved in personal health care; these vacancies have not been filled.

According to the 1988 university census, the student population in health-related fields was broken down as follows: 6,698 medical students (2,750 men and 3,948 women), 1,283 dentistry students (404 men and 879 women), 687 dental auxiliaries, 670 nurses, 153 students of nutrition and dietetics, 49 midwives, and 2,410 medical technologists. Table 11 shows the number of graduates in 1986 and 1987: these data illustrate the changes in the training of physicians and, to a lesser extent, dentists; they also show that nursing has been marginalized, that women predominate among the graduates, and that training for medical technologists has increased.

| School/program | 1986 | | | 1987 | | |
|-------------------------|-------|-----|-----|-------|-----|-----|
| | Total | M | F | Total | M | F |
| Medicine | 346 | 168 | 178 | 495 | 254 | 241 |
| Dentistry | 130 | 39 | 91 | 142 | 26 | 116 |
| Pharmacy | 40 | 8 | 32 | 59 | 11 | 48 |
| Nursing | 111 | 3 | 108 | 93 | 2 | 91 |
| Nutrition and dietetics | 19 | — | 19 | 19 | — | 19 |
| Obstetrics | 32 | — | 32 | 4 | — | 4 |
| Medical technology | 252 | 60 | 192 | 382 | 51 | 331 |

Health Services Technologies

The national pharmaceutical industry prepares its products from imported raw materials. There are 89 companies, 22 of which are United States and European transnationals that cover 69% of the market. The Ministry of Public Health has a laboratory that produces various drugs, and also is responsible for the registration and quality control of drugs sold in the country. However, the pharmaceutical industry partially finances the laboratory that fulfills this function. Of the almost 20,000 products registered, some 2,000 are marketed in 2,800 presentations. A List of Essential Drugs, which contains around 400 products, is used only in services that come under the Ministry of Public Health. Drug prices are set by the Ministry of Economy and Finance; in 1987 total expenditure for drugs was estimated at \$US102 million (approximately \$US34 per capita annually).

During 1985–1988, the Ministry developed a policy for controlling the introduction of medical equipment; for this purpose, the Department of Medical Technology was created within the Planning Bureau. The Department's objectives include ensuring the quality, availability, and maintenance of the equipment allowed into the country for use in the public and private sectors, as well as guaranteeing the rational incorporation of technology according to the needs of the population. Although a liberal economic policy is followed in other areas, the Ministry exerts strict control in this category, and no medical equipment can be imported without prior authorization.

Technological capability is distributed very unevenly and is concentrated in the capital. For example, the four tomography units and specialized centers such as those for heart surgery and traumatology, are located in Montevideo. Not only is the technology unevenly distributed

geographically, the most sophisticated technological resources are concentrated in the private medical sector.

Family Medicine

In November 1986, the ASSE established the first Family Medicine Unit. An introductory course of several weeks duration, offered by PAHO and the Ministry, trains physicians in this field. The first 38 physicians to practice in this area in 1988 were evaluated. Of the total consultations, 78% were resolved, 17.3% were referred to specialists, and 4.7% were hospitalized. In contrast, of total consultations attended in 1988 at other health centers by general practitioners who were not trained in the introductory family medicine course, 39% were resolved, 56% were referred to specialists, and 4.9% were hospitalized.

The first Family Medicine Unit is located in a health center, which coordinates, supervises, and organizes the work of the physicians and their health teams. An additional 62 general practitioners are projected to be trained in 1989. The goal for 1990 is to have 100 trained physicians in order to expand coverage to 220,000 persons. The University is expected to develop a graduate-level program in family medicine soon.

HEALTH AND THE ENVIRONMENT

Water and Sewerage Service

The running water connections installed from 1983 to 1987 reflect an upward trend for the last two years (an average of some 22,000 as compared to 8,000 in the first

three years). Most of these connections are replacements, since the number of new installations has been decreasing. Considering installations nationwide, the served population would have increased 9.4% from 1983 to 1987, with figures of 5.5% for Montevideo and 12.7% for the interior. Total coverage comes to 72.6% of the total population, with figures of 95.1% for Montevideo and 54.4% for the rest of the country.

Updated sewerage figures are available only for the interior, which is under the responsibility of the State Sanitary Works, whereas Montevideo is under the responsibility of the departmental intendency. For that area, coverage for sewerage services was 26.7% as of December 1987.

Environmental Pollution

Although Uruguay is not highly industrialized, it does have pollution problems, especially in its waterways. The

three streams that course through the city of Montevideo are contaminated by human waste and by pollution from industries along their banks. Colibacillus contamination along Montevideo's coast led to a Ministry of Public Health warning against bathing in those waters in the summer of 1988. This situation has improved somewhat, and some of the beaches were restored in the summer of 1988–1989. The situation in the rest of the country is much better due to the smaller population and a relative lack of industry.

Solid waste disposal is under the responsibility of each departmental intendency. Waste is disposed of in sanitary landfills, but work has begun on the installation of a biogas plant that would operate with wastes from the city of Montevideo. Refuse handling is an income source for many in the marginal population who work in totally insalubrious conditions to provide much of the raw materials for different industries, especially the paper industry.

VENEZUELA

GENERAL CONTEXT

Political, Economic, and Social Situation

Venezuela is a federal republic comprising twenty states, two federal territories, a federal district, and several federal dependencies. As of 31 December 1987, the states were organized into 258 autonomous municipalities and 645 suburban and urban municipalities; the federal district was divided into two autonomous municipalities, which in turn were broken down into 27 parishes; and the federal territories had a total of seven departments. Administratively, Venezuela is divided into nine regions: Capital, Central, Llanos, West-central, Zulia, Andes, Northeast, Insular, and Guyana.

The country has been governed by a participatory democratic government for more than 30 years. At the end of 1988, elections were held for the President of the Republic and for members of the National Congress and the State Legislative Assemblies for the period 1989–1994. Citizens are organized into political parties, unions, professional organizations, and neighborhood associations, which have grown considerably in recent years.

The national currency is the bolivar, which had a stable exchange rate with the United States dollar until the beginning of 1983. Since then it has undergone several devaluations, with exchange rates varying according to the transactions involved. In 1987 the average value of the Venezuelan currency was Bs10.19 per \$US1, owing to a major devaluation in December 1986, which established an exchange rate of Bs14.50 per \$US1. There is also an open market for dollars which has fluctuated over the years: in 1985 the average value was Bs13.75 per \$US1, and in 1987 the rate reached Bs27.93 per \$US1 (Table 1). In 1988 most imports paid for in "controlled" dollars were at the rate of 14.50 bolivars. As of 31 December 1988 the free market rate was Bs39.30 per \$US1.

During 1985–1987, the economy experienced moderate growth in the gross domestic product (GDP) as expressed in bolivars at constant 1984 prices. The Central Bank of Venezuela estimates that by 1988 the GDP had risen by 4.2%. An analysis of commercial and noncommercial portions of the GDP showed similar increases for 1985–1986, but not for 1986–1987, when noncommercial portions grew almost twice as much as commer-

cial ones, mainly due to meager increases in oil activity during 1987.

The per capita GDP (Bs.18,361 for 1980) showed a moderate increase during 1985–1987; however, if compared with the per capita GDP expressed in \$US, it showed a considerable decline, from \$US4,270 in 1980 to \$US2,454 in 1987. In part, this is a result of the bolivar's devaluation. In 1985 and 1986 public spending accounted for slightly more than 13% of the GDP.

Net international reserves steadily declined during the period, from \$US13.750 billion in 1985 to \$US9.376 billion in 1987 (Table 1). The balance of payments, which had been positive until 1985, was negative for 1986 and 1987, and although the deficit remained slight in 1987, it had increased by 1988. This deficit was caused mainly by declining prices for oil, the country's principal export, whose average export price had declined by approxi-

TABLE 1

Selected economic indicators, Venezuela, 1985–1987.

| Indicator | 1985 | 1986 | 1987 |
|---|---------|---------|---------|
| GDP ^a | 414,750 | 443,043 | 456,544 |
| Per capita GDP ^b | 23,951 | 24,905 | 24,986 |
| Per capita GDP ^c | 3,443 | 3,442 | 2,454 |
| Balance of payments ^d | 3,086 | -1,471 | -1,125 |
| Balance of trade ^d | 6,790 | 1,260 | 1,735 |
| International reserves ^d | 13,750 | 9,858 | 9,376 |
| Operating reserves ^d | 8,207 | 4,273 | 3,518 |
| Inflation (national average) (%) | 11.4 | 11.6 | 28.1 |
| Inflation (percentage point average) (%) ^e | 9.2 | 12.7 | 40.3 |
| Average exchange (controlled dollar) | 6.96 | 7.24 | 10.19 |
| Average exchange (open-market dollar) | 13.75 | 19.87 | 27.93 |

^aIn millions of bolivars at constant 1984 prices.

^bIn bolivars.

^cIn \$US.

^dIn millions of \$US.

^eFor the metropolitan area.

Source: Economic Report of the Central Bank of Venezuela, 1987.

mately 51% in 1986. In 1988 this value increased again by 27%. Although oil accounts for most exports, its percentage of the total value of exports declined from 90.7% in 1985 to 83.2% in 1986, and then increased slightly to 85.7% in 1987. Iron and aluminium products, which accounted for another large share of exports, went from 5% in 1985 to 7.9% in 1987.

In 1985–1987, the balance of trade declined markedly in 1986 and recovered moderately in 1987 because of a drop in imports and an increase in exports for that year. The national debt in 1988 was approximately \$US35 billion, and it showed little fluctuation during the period. The inflation index for the country as a whole was around 11% in 1985 and 1986, and increased to 28% in 1987 (Table 1) and to 35.5% in 1988.

An analysis of the employment situation shows that the unemployment rate of 14.0% for the first quarter of 1985 gradually declined to 7.7% of the work force in the first half of 1988.

The active labor force is mostly employed by the private sector (44%), followed by public sector workers (18%), the self-employed (16%), and agricultural workers (14%). Major areas are community and social services (27%), trade and services (20%), manufacturing (17%), and agriculture (14%). Underemployment in the non-agricultural population, measured as those working 21 hours or fewer per week, shows that for the first half of 1988, 0.84% of the labor force worked between 1 and 14 hours per week, and 2.10% between 14 and 21 hours. The median monthly income per person for the first half of 1988 was \$US275 (controlled market) or \$US101 (open market). This income varies from region to region. Median monthly household income for the same period was \$US464 or \$US169, depending on the exchange rate; in the cities the amount was almost twice as much as that in the rural areas.

Venezuela has made significant educational gains over the last 40 years. The illiteracy index in the population aged 15 and over was 49% according to the 1950 census, but had fallen to 10.5% by the second half of 1987; it was higher for women (12.2%) than for men (8.6%). The Andes, West-central, and Northeastern regions had the highest illiteracy rates (more than 15%), and the Caracas metropolitan area and the capital had the lowest (under 5%). Schooling at all levels has increased, and higher education enrollment has risen 66% over the past ten years.

Food availability is adequate on the whole. The basic family food basket, estimated by a group at the Central University of Venezuela, cost Bs2,000 in the metropolitan area of Caracas in August 1987, or 80% of the official minimum wage at the time. When that cost was compared with family income, 2.6% of the households in that area had a lower monthly income.

Demographic Characteristics

The estimated population for 1988 was 18,757,389, with an increase of approximately half a million per year. The geographical distribution of the population shows a high concentration in the north central coastal area—which includes Miranda, Aragua, and Carabobo states and the federal district—representing 39% of the total population, and Zulia State, with almost 12%. The population density is greater than 1,000 persons per km² in the federal district, greater than 150 in Aragua, Carabobo, Miranda, and Nueva Esparta states, and less than 10 in the two federal territories and in Apure, Bolívar, and Guárico states. Three-fourths of the total population is concentrated in urban areas. In the large cities there are large and densely populated marginal areas.

Thirty-nine percent of the population is under 15 years of age. The population aged 65 years and over accounts for only 5.5% of the total, but the proportion has been increasing progressively, especially for women. This means that the economically dependent population represents almost 45% of the total population.

The crude birth rate for 1985–1987 ranged from 29.9 per 1,000 population in 1985 to 28.3 in 1987. This slow and steady decline, which may be expected to continue, leads to a progressive aging of the population and to a slowing of natural growth.

Overall fertility also has been declining: from 4.0 per 1,000 women in 1982 to 3.4 in 1986 and 1987. However, age-specific fertility is showing a moderate increase among women under the age of 20.

No figures are available for internal migration; it can only be estimated that there are significant population shifts to the metropolitan areas and to the industrial areas in particular. Migration out of the country showed a negative balance for 1985–1987, as it has in almost every year of the present decade.

ANALYSIS OF PRINCIPAL HEALTH PROBLEMS

General Mortality and Morbidity

Mortality registration coverage is satisfactory; the Venezuelan Center for the Classification of Disease (CEVECE) estimates that underregistration does not exceed 3%. The quality of medical certification is less satisfactory: for 1984–1986, total undiagnosed deaths represented 17%, while those registered as symptoms, signs, and ill-defined conditions amounted to 30%.

Birthrate shows more underregistration than mortality, and some births are registered very late. Of the total births

registered in 1987, only 53% had occurred that year and 7% had occurred at least two years earlier.

The country's crude death rate is relatively low: 4.6 per 1,000 population in 1985 and 4.4 in 1986. The death rate is lower in women than in men (3.9 and 4.6 per 1,000, respectively, in 1986). In 1986 only three states—Guárico, Portuguesa, and Trujillo—showed crude rates of between 5 and 6 per 1,000, while Anzoátegui and Aragua states and the federal territory of Amazonas had death rates of between 3 and 4 per 1,000.

Life expectancy at birth in 1986 was 71.7 years for both sexes combined, 69.7 for men, and 74.6 for women. These figures show an increase of almost one year in life expectancy since 1984.

The five leading causes of death have held the same ranking since 1984; in descending order, they are: heart diseases (393–398, 402, 404, 410–429), cancer (140–208, 230–234), accidents (E800–E949), certain conditions originating in the perinatal period (760–779, except 771.3), and cerebrovascular diseases (430–438). The ten leading causes include only two infectious diseases—pneumonias (480–486), in sixth place, and enteritis and other diarrheal diseases (008–009) in eighth place in 1985 and ninth place in 1986.

Among the causes of mortality by sex, the difference between the five leading causes is accounted for by accidents, which occupy first place (with the same number of deaths as cardiovascular diseases) for men, and barely fifth place for women. A comparison of the rates by sex for 1986 for the five leading causes shows that among men the highest rates were for accidents (five times greater), cardiovascular diseases, and certain conditions originating in the perinatal period; the lowest were for the other two causes.

Infant mortality has declined steadily, falling from 26.9 to 25.8 per 1,000 live births between 1985 and 1986. Barinas, Miranda, Portuguesa, and Trujillo states and the federal territory of Delta Amacuro had rates of between 30 and 40 per 1,000 live births, and the federal territory of Amazonas had a rate of 55 per 1,000 live births. By contrast, in the federal district and in Anzoátegui and Yaracuy states figures ranged between 15 and 20 per 1,000 live births.

Health Situation of Specific Population Groups

Child Health

Health data included here deal mainly with mortality, since they are the most available. Among children under age 1, the main causes of mortality in 1986 were, in descending order: hypoxia, asphyxia, and other respira-

tory conditions (768–770); enteritis and other diarrheal diseases (008–009); congenital anomalies (740–759); other diseases of the newborn (764, 766, 767, 771.0–771.2, 771.4–771.8, 774–779); diseases of the respiratory system (480–487, 490–493); lesions and complications of delivery (760, 761–763, 772, 773); accidents (E800–E949); prematurity (765); septicemia (038); and meningitis (320–322). Of these processes, enteritis, immaturity, and septicemia show a moderate downward trend; accidents and meningitis show a slight increase; and the rest have remained stable.

In terms of morbidity, gastroenteritis continues to be an important public health problem for children under the age of 2, with a range of 180,000 to 200,000 cases per year during 1985–1988. Measles remains a problem, with 13,000 to 20,000 cases registered each year for that same period.

The main causes of mortality in children aged 1–4 years are accidents (E800–E949); pneumonias (480–486); and enteritis and other diarrheal diseases (008–009). Although measles is included among the ten principal causes of death, it moved to eighth place in 1986 from fourth in 1985. The sixth cause in 1986 was undernutrition, which along with accidents showed an increase in this age group. Of particular concern is the fact that measles, a preventable disease, is included among the more important causes of death in children in this age group.

Among children aged 5 to 14, accidents are the leading cause of death, and suicides and homicides (E950–E969) the fifth. Chronic and degenerative conditions such as cancer, heart diseases, and epilepsy begin to gather importance as causes of death beginning with this age group. Pneumonia ranks as the third leading cause of mortality.

Despite control programs, enteritis, diarrhea, and respiratory infections remain important causes of death for children.

The 1981–1982 national nutrition survey showed that in children 12 years of age, 15% suffered from undernutrition according to weight-for-age scale, 11.7% were small for their age, and 13% were overweight.

Health of Adolescents and Adults

In adolescents and young adults (ages 15 to 24), with the exception of pneumonias (480–486), which rank sixth, all causes of death are noninfectious processes, the most important being accidents (E800–E949), cancer (140–208, 230–234), and suicides and homicides (E950–E969). The leading cause of death in women is cancer, and in this age group the specific rates for cancer and cerebrovascular diseases are higher than those for men, who otherwise have higher rates for all other causes. In 1986, complications of pregnancy, childbirth and the

puerperium (630–639, 640–676) were the fifth cause of death among women in this age group.

Most activities aimed at adolescents are carried out by the Ministry of the Family, with some coordination with the Ministry of Health and Social Welfare.

For the 45–64-year age group, heart diseases (393–398, 402, 404, 410–429) and cancer (140–208, 230–234) rank first, and diabetes mellitus (250), fifth. Accidents are much more important as a cause of death in men than in women. The rates for cancer and heart diseases are similar; however, the latter appear to have increased significantly among women in recent years.

Maternal mortality in the country is quite low. In 1986 the rate was 0.6 per 1,000 live births.

Health of the Elderly

In this age group the principal causes of death are chronic conditions, especially heart diseases (393–398, 402, 404, 410–429), cancer (140–208, 230–234), cerebrovascular diseases (430–438), diabetes mellitus (250), and, to a lesser degree, accidents (E800–E949). Among infectious diseases, pneumonia (480–486) poses a problem for this age group.

As expected, cause-of-death rates for this group increase with age. Mortality is higher in men than in women for the main causes of death, except for diabetes mellitus.

The most frequent cancer sites are the digestive tract, especially the stomach and the colon, the respiratory tract, the cervix and uterus, and the breast; leukemias are also significant. In the case of heart diseases, the conditions that most frequently lead to mortality are ischemic heart lesions and conditions associated with arterial hypertension.

Problems Affecting the General Population

During 1985–1988 heavy rains led to floods and landslides which affected some population groups. The most serious problem of this type occurred in Aragua State, around Henri Pitier Park to the north of the state capital, Maracay. Approximately 200 deaths, 15,000 injuries, and 100 missing persons were reported.

Some areas have had localized outbreaks of measles, gastroenteritis, and chickenpox.

Malaria remains a problem despite control efforts: 14,419 cases were registered in 1985 and 46,300 in 1988. Most occurred in Bolívar and Sucre states; in the former because of population shifts related to mining activity and in the latter because of the vector's characteristics.

No cases of yellow fever have been reported since 1979, despite the fact that a large portion of the country's territory lies in an area where jungle yellow fever can occur.

The disease is under control and, although there are jungle foci in Aragua State, no human cases have been registered since 1962.

In Venezuela, AIDS appears not to have reached the levels it has in other countries; by the end of 1988, fewer than 300 cases had been registered. However, the size of the infected population is unknown. The Ministry of Health and Social Welfare is conducting studies to learn the dimensions of this problem. In the case of leprosy, as of 31 December 1987, there were 12,540 registered cases, with a prevalence rate of 0.69%. Most cases (59.4%) were multibacillary. During 1987, 440 new cases were detected, representing a detection rate of 0.24 per 1,000. Currently, studies are being conducted to evaluate immunotherapy and immunoprophylaxis for this disease.

Leishmaniasis is an important problem, with some 2,500 cases detected annually in 1985–1988. Most of the cases were from Trujillo, Sucre, Miranda, and Lara states. As with leprosy, tests for immunoprophylaxis and immunotherapy are being carried out.

In 1987 there was an epidemic of bovine rabies that began in Portuguesa State and spread in 1988–1989 to Barinas, Apure, Táchira, and Bolívar states, affecting more than 500 herds. Between December 1987 and April 1988 there was also an epidemic of canine rabies in Aragua State.

DEVELOPMENT OF THE HEALTH SERVICES INFRASTRUCTURE

In 1987 the Congress promulgated the Organic Law of the National Health System, which prescribes—under the direction and administration of the Executive Branch and through the Ministry of Health and Social Welfare—the integration of all the country's health protection services, as well as the policy-making role that will regulate the activities of the private health subsector. The integration of public sector services covered by the law is to be completed within a ten-year period beginning when the law went into effect. Since the law's passage, only initial steps have been taken toward integrating all the health services that come under the Executive Branch, which are provided by many different institutions. By the end of 1988 the first programs were being tried out; these began in 1987 with a pilot district in Anzoátegui State and then spread to other districts in Carabobo, Falcón, Mérida, Nueva Esparta, Táchira, Trujillo, and Zulia states. The most important institutions in terms of volume of investments and population covered are the Ministry of Health and Social Welfare, the Venezuelan Institute of Social Security, the Institute of Social Welfare of the Ministry of Education, and the federal district's bureau of health.

One of the most important characteristics of the development strategy for the national health system is the impetus toward primary care, which includes the community's participation in its health care. Another is administrative decentralization, with increased transfer of decision-making responsibility to the state level.

The national health system is responsible for health services delivery to the population in the integrated areas; in the nonintegrated areas, this responsibility comes under one of the above-mentioned agencies. The private health subsector serves approximately 10% to 15% of the population.

Regarding installed capacity, in 1985 the country had 317 type I urban outpatient facilities, which increased to 514 by 1986. Type II urban outpatient facilities increased from 59 to 74, and type III facilities increased from 21 to 33 between 1985 and 1986. Type I rural outpatient facilities increased from 1,728 to 2,395, and type II facilities increased from 384 to 564 during the same years. In terms of more complex establishments, in 1986 there were 541 hospitals, of which 230 were governmental and 311 private (in 1985 there were 534 hospitals; 229 government and 305 private); most hospital increases occurred in the private sector.

Government hospitals, for the most part, come under the Ministry of Health and Social Welfare (176), followed by those under the Venezuelan Institute of Social Security (29), the municipalities (17), and the Ministry of Defense (8). In 1986 the country had 47,535 hospital beds, with an index of 2.7 beds per 1,000 population. Of these, 26,426 were under the Ministry of Health and Social Welfare. The federal district had 5.4 beds per 1,000 population; Yaracuy, Zulia, and Guarico states had more than 3 per 1,000; and Apure, Barinas, and Portuguesa states and the federal territory of Amazonas had fewer than 1.5 beds per 1,000 population (Table 2).

The number of physicians increased from 21,666 in 1985 to 28,400 in 1987 (or from 1.25 to 1.55 physicians per 1,000 population, respectively). Most physicians worked in the federal district and in Mérida and Zulia states, in whose capitals the oldest schools of medicine are found (Table 2).

The number of professional nurses is low in proportion to the number of physicians. There were only 13,871 nurses registered in 1985 and 14,398 in 1987, for an approximate rate of 0.8 per 1,000 population. There were more nursing auxiliaries: 40,102 in 1987, or 2.2 per 1,000 population (Table 2).

The number of dentists and pharmacists is low; in 1985 the rates were 0.36 and 0.28 per 1,000 population, respectively (Table 2).

The overall distribution of health manpower is uneven, with higher concentrations in the above-mentioned areas.

Regarding health activities, the number of consulta-

tions provided by the institutions under the Ministry of Health has increased yearly, both in absolute figures and in proportion to the population (from 0.96 consultations per inhabitant in 1984 to 1.70 in 1987). The Venezuelan Institute of Social Security provided 2.16 consultations per beneficiary in 1985.

Most consultations are curative; for the Ministry of Health and Social Welfare institutions there was a ratio of more than two curative consultations to every preventive one in each of the years under study. In the services handling the consultations for the Ministry institutions, in 1982, 1983, and 1985 the number of consultations carried out in the hospitals exceeded those in the outpatient facilities, while in 1984, 1986, and 1987 the reverse was true.

The number of discharges per 1,000 population for the hospitals under the Ministry was 40 in 1985 and 1986, and increased to 57 in 1987. The hospitals under the Venezuelan Institute of Social Security had 38 discharges per 1,000 beneficiaries in 1985.

The occupancy rate for 1985–1986 neared 50% for Ministry hospitals, and increased to 77% in 1987. In the hospitals under the Venezuelan Institute of Social Security, this indicator reached 72% in 1985. The average length of stay for all the country's hospitals was approximately six days for the institutions under the Ministry and the Venezuelan Institute of Social Security.

The number of dental consultations provided by the Ministry of Health and Social Welfare has increased, although the number of visits remains very low: in 1987 there were only 0.34 visits per inhabitant per year and in 1985 the figure was 0.10.

Regularly administered vaccinations in the country are those recommended by the EPI plus yellow fever vaccine, which is especially given in the areas at greatest risk for this disease. EPI-distributed vaccines are given throughout the year by the health services, especially those under the Ministry of Health and Social Welfare; in addition, special annual vaccination days are held in an attempt to improve coverage. Although the coverage reported in almost the entire country is approximately 70% for each EPI vaccine, special studies based on surveys carried out in some of the cities place the level at between 80% and 90%. Surveys have been planned in many populations in order to determine true vaccination coverage.

The National Institute of Nutrition is conducting several food supplementation programs, particularly for schoolchildren and pregnant women, as well as programs for family dietary protection.

In 1987 there were 149 blood banks in the country, of which 112 were government-run.

Almost all the country's health services, governmental and private, have laboratory services. In addition, there are many independent laboratories.

| State or territory | Beds | Physicians | Nurses | Auxiliaries | Dentists | Pharmacists |
|---------------------------------|------|------------|--------|-------------|----------|-------------|
| Venezuela | 2.74 | 1.25 | 0.80 | 2.30 | 0.36 | 0.28 |
| Federal District ^a | 5.45 | 2.15 | 1.66 | 4.37 | 1.12 | 0.54 |
| Anzoátegui | 2.33 | 0.88 | 0.85 | 3.92 | 0.18 | 0.22 |
| Apure | 1.48 | 1.11 | 0.54 | 1.69 | 0.10 | 0.12 |
| Aragua | 1.45 | 0.79 | 0.67 | 1.88 | 0.22 | 0.22 |
| Barinas | 1.10 | 0.70 | 0.34 | 1.64 | 0.08 | 0.16 |
| Bolívar | 2.05 | 1.04 | 0.90 | 2.44 | 0.13 | 0.20 |
| Carabobo | 2.72 | 1.00 | 0.70 | 1.93 | 0.40 | 0.22 |
| Cojedes | 1.74 | 1.55 | 0.69 | 2.51 | 0.14 | 0.14 |
| Falcón | 1.68 | 0.68 | 0.47 | 1.55 | 0.15 | 0.11 |
| Guárico | 3.45 | 1.08 | 0.66 | 2.49 | 0.12 | 0.19 |
| Lara | 2.11 | 0.88 | 0.79 | 1.91 | 0.25 | 0.24 |
| Mérida | 2.31 | 1.63 | 0.66 | 1.70 | 0.61 | 0.40 |
| Miranda ^b | 1.53 | 0.86 | 0.14 | 0.60 | 0.08 | |
| Monagas | 1.88 | 1.02 | 0.61 | 2.69 | 0.15 | 0.16 |
| Nueva Esparta | 1.56 | 1.26 | 0.50 | 2.46 | 0.20 | 0.21 |
| Portuguesa | 1.36 | 0.86 | 0.67 | 1.42 | 0.12 | 0.15 |
| Sucre | 1.99 | 0.88 | 0.66 | 1.81 | 0.10 | 0.12 |
| Táchira | 2.83 | 0.94 | 1.00 | 2.08 | 0.16 | 0.18 |
| Trujillo | 2.96 | 1.23 | 0.58 | 2.68 | 0.20 | 0.15 |
| Yaracuy | 3.55 | 1.03 | 0.54 | 1.65 | 0.11 | 0.18 |
| Zulia | 3.41 | 1.36 | 0.87 | 2.00 | 0.49 | 0.20 |
| Amazonas Federal Territory | 1.13 | 1.00 | 0.35 | 2.29 | 0.10 | |
| Delta Amacuro Federal Territory | 2.19 | 0.98 | 0.55 | 2.94 | 0.12 | 0.14 |

^aIncludes physicians in the Sucre District of Miranda State. Includes pharmacologists in Miranda State.

^bDoes not include the physicians in the Sucre District of Miranda State. Does not include the pharmacologists in Miranda State.

Source: Ministry of Health and Social Welfare. Epidemiology and vital statistics annual 1985.

Health research is limited, especially health services research. Most of the scanty research that is published deals with the field of medicine.

Health expenditures were slightly more than Bs10 billion in 1985 and 12.5 billion in 1986 (9.7% and 10.3%, respectively, of total expenditures by the national government for the two years). This amount represents 1.8% of the GDP for each of those years, but undoubtedly the estimate is low because it does not include investments

in the private sector or some of the health-related expenditures made by the Government.

HEALTH AND THE ENVIRONMENT

In 1987 the total population supplied with drinking water was 16,790,100 (92% of the country's inhabitants). The majority (87.5%) had direct connections;

92.3% of the urban population and 90% of the rural population were served. The volume of drinking water per inhabitant remains at nearly 100 m³ per year.

Systems for excreta disposal and sewerage were available to 98% of the population in 1987, and 61.5% had

sewer connections (70.1% of the urban population). With regard to food safety, during 1987 and 1988 efforts were made to gain a better understanding of the problem, with a special attempt to study the frequency and characteristics of foodborne diseases.