



Epidemiological Bulletin

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Celebrating 100 Years of Health

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New Priorities and Challenges for Epidemiology in the Americas

This year the Pan American Health Organization (PAHO) begins its second century of existence. As was already mentioned in the first issue of 2002 of this *Bulletin*, PAHO was created in response to the need for international collaboration in controlling the propagation of communicable diseases. Almost 20 years after its creation, the political and technical bases were laid to put in practice its surveillance and control functions through the development of the Sanitary Code. PAHO's history to date has been marked by the appearance of pandemics such as the 1918 flu, cholera in 1991, and the appearance of AIDS in 1981. The Region of the Americas is now being affected by another serious pandemic, that of Severe Acute Respiratory Syndrome (SARS), which initiated its propagation in Asia. In today's interconnected world, the disease has spread at a rapid pace around the Globe, but its detection and investigation have also been timelier than previous pandemic-causing diseases. In the midst of this situation, we are reminded once more of the importance of the role of multilateral international health cooperation agencies (such as PAHO and WHO), of the need for sharing information on affected populations, for concerted action by the countries for the control of disease transmission, and for the establishment of cooperation networks in order to increase the efficiency of public health activities. Since its creation in 1980, the *Epidemiological Bulletin* has provided up-to-date information on the situation and epidemiological surveillance of priority diseases, as well as on the measures, strategies, and policies to prevent and control them. This issue will dis-

seminate some aspects of the process of information and consultation on the new public health threat of SARS in the Region.

PAHO also begins this year with a new administration, under the leadership of Dr. Mirta Roses. Although there have been recognized health gains in the countries and territories of the Americas since the implementation of Primary Health Care more than two decades ago, some gaps remain to be filled. Some diseases have been controlled or eradicated, yet new health problems have arisen, such as those related to new lifestyles, like obesity, or those characteristic of older population groups and associated with the aging of the Region's population. PAHO has established among its priorities and strategies to emphasize its work with the countries that find themselves at greater health disadvantages compared to the rest of the Region. Targeting these countries should increase coordination and make more effective the actions of support and development, towards the fulfillment of the Millennium Development Goals adopted by the countries in the United Nations Assembly, and of technical cooperation in public health. With this idea in mind, the *Bulletin* publishes in this issue a summary of the health situation analysis and trends in Bolivia, Guyana, Haiti, Honduras, and Nicaragua, based on the publication *Health in the Americas, 2002*, one of PAHO's flagship products. It is expected that this information will be of interest to different groups and agencies. Syntheses of information on these and other countries will be included periodically in future issues of the *Bulletin*.

Global Alert: Severe Acute Respiratory Syndrome (SARS)

Since 12 March 2003, the world has been alerted to a global outbreak of a severe acute respiratory syndrome (SARS), a previously unrecognized infectious disease that has reached 21 countries and affecting directly as many as 3000 people in less than a month. In response to this epidemic, the World Health Organization (WHO) has issued case definitions, case management guidelines, infection control recommendations and travel advisories to detect and prevent further dissemination (See Boxes 1 to 3). In addition, WHO has coordinated a global response by forming networks of investigative teams to control this disease.

Retrospective epidemiologic investigations have shown that the first known cases of SARS originated from the Guangdong Province of China in an outbreak of atypical pneumonia that started in November 2002. It was not until February 2003 that SARS was first described in Hanoi, Vietnam when previous-

ly healthy hospital staff fell sick and were found to have had direct contact with a 48 year-old patient, who had traveled to Hong Kong before becoming sick.

At the same time, in a local hospital in Hong Kong, an increase in the number of cases of respiratory illness in health care workers was reported to the Department of Health. As in Hanoi, these cases were also epidemiologically linked to an index case. It was later discovered that this Hong Kong index patient had visited a friend in the Hotel Metropol in late February while an ill visitor from the Guangdong Province was staying there.

At first these outbreaks seemed to be isolated. However, tracing their origins led investigators to a common factor. Both index cases had stayed in the Hotel Metropol during the same time period. Upon further investigation, a cluster of

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13 persons was identified, most of whom had stayed on the same floor of the hotel. Many had traveled internationally and several became index patients in subsequent clusters in Canada, Hong Kong, Singapore, United States and Vietnam.

Since then, SARS has emerged in various places proving to be a contagious and in some cases, a fatal disease in a highly mobile and interconnected world. As of 15 May 2003, there are 7,699 probable cases including 598 deaths in 29¹ countries. Many initial reports of cases were tightly linked to clusters that, so far, have characterized the epidemiology of this disease. The majority of these cases has been among health care workers and close, person-to-person contacts. It has been determined that transmission occurs mainly by respiratory droplets, direct contact with secretions, or that the virus may be, in some cases, airborne. There have been preliminary studies showing the presence of the virus in feces and other body fluids, which may suggest other mechanisms for SARS transmission.

The hardest hit areas have been China, Hong Kong, Singapore and Canada, despite established hospital infection and patient isolation guidelines. In these areas, outbreaks have gone beyond hospitals giving rise to considerable concern and emphasizing that SARS' epidemiology is not yet fully understood. Outbreaks occurring in a hotel and a residential building, Amoy Gardens, in Hong Kong indicate that transmission may involve an environmental component as a cofactor in spreading the disease. In addition, some cases have shown to be "super-spreaders", that is, they infected an unexpected large amount of people. It is not known whether these "super-spreaders" are secreting large amounts of infectious material or whether some other factor is working to amplify transmission.

The remaining countries have reported limited transmission to family members and health care workers, perhaps due to heightened surveillance with strict patient isolation and infection control practices. However, should SARS spread beyond clusters before a sensitive and specific diagnostic test becomes available, accurate clinical descriptions will be very important in modifying the current WHO case definition. Unfortunately, because this syndrome is not distinct from common wintertime illnesses, early detection might be difficult.

As of 7 May 2003, WHO estimates an overall case fatality ratio of 14 to 15% depending on the age group of the cases and the existence of underlying illnesses. Based on available data to date, the case fatality ratio is estimated to be less than 1% in persons 24 years old or younger, 6% in persons 25 to 44, 15% in persons 45 to 64 and greater than 50% in persons aged 65 years and older.

As part of the global response to the SARS outbreak, WHO has established a laboratory research network consisting of 11 laboratories in 9 countries: Canada, France, Germany, Japan, Hong Kong, the Netherlands, Singapore, United Kingdom and United States of America.

In less than two months, progress has been made in finding the causative agent. Collaborating laboratories have concluded that the etiology of SARS is a novel coronavirus, now a new member of the family *Coronaviridae* comprising of 15 species that infect vertebrates. Although several laboratories have completed the genome sequence of the virus, the origin of the virus is still unclear. To understand its ori-

gins, epidemiologic studies of the first cases of SARS that are believed to have occurred in Guangdong, China, have to be conducted. The role of other pathogens in the causality or as cofactors of SARS, such as Human metapneumovirus (hMPV) and *Chlamydia spp* found in respiratory specimens, has yet to be determined.

Collaborative efforts are still being focused on developing valid and consistent detection and rapid diagnostic tests. Progress in these developments continues to be critical for detecting disease in early stages, understanding the pathways of transmission and developing preventive measures.

Three diagnostic tests have been described but all have limitations in bringing the SARS outbreak under control. The ELISA test detects antibodies but only 21 days or more after onset of illness. Therefore, it cannot be used to detect cases at an early stage before they have a chance to spread the infection to others. The second test, immunofluorescence assay (IFA) detects antibodies 10 days or more after infection, but it is time consuming. The polymerase chain reaction (PCR) molecular test for detection of SARS virus genetic material has been shown to be useful in the early stages of infection but produces many false-negatives - many persons who actually carry the virus may not be detected - creating a dangerous sense of false security for a virus that is known to spread easily in close person-to-person contact. PCR results can be used to complement clinical diagnosis. However, tests have not been validated for confirmation of cases or exclusion of the disease. The WHO case definition (see box 1) remains unchanged at present.

Most patients identified have been previously healthy adults aged 25-70 years. Most cases (90%) have been mild and 10% have been severe. A few suspected cases of SARS have been reported among children (≤ 15 years).

As of 7 May 2003, WHO estimates the maximum incubation period to be 10 days. The illness generally begins with a prodrome of fever ($>38^{\circ}\text{C}$), which is often high, sometimes associated with chills and stiffness and sometimes accompanied by other symptoms including headache, malaise, and myalgias. At the onset of illness, some cases have mild respiratory symptoms. Typically, rash and neurologic or gastrointestinal findings are absent, although a few patients have reported diarrhea during the febrile prodrome. After 3-7 days, a lower respiratory phase begins with the onset of a dry, non-productive cough or dyspnea that may be accompanied by or progress to hypoxemia.

Chest X-rays may be normal during the febrile prodrome and throughout the course of illness. However, in a substantial proportion of patients, the respiratory phase is characterized by early focal infiltrates progressing to more generalized, patchy, interstitial infiltrates. Some chest radiographs from patients in the late stages of SARS have also shown areas of consolidation.

Early in the course of disease, the absolute lymphocyte count is often decreased. Overall white cell counts have generally been normal or decreased. At the peak of the respiratory illness, up to half of patients have leukopenia and thrombocytopenia or low-normal platelet counts (50,000-150,000/ μl). Early in the respiratory phase, elevated creatine phosphokinase levels (up to 3000 IU/l) and hepatic transaminases (2 to 6 times above normal) have been noted. Renal function has remained normal in the majority of patients.

Treatment regimens have included a variety of antibiotics to presumptively treat known bacterial agents of atypical pneumonia. In several locations, therapy has also included

¹ Countries that have reported cases: Australia, Brazil, Bulgaria, Canada, China (mainland, Hong Kong, Macao and Taiwan), Colombia, Finland, France, Germany, India, Indonesia, Italy, Kuwait, Malaysia, Mongolia, New Zealand, Philippines, Republic of Ireland, Republic of Korea, Romania, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, United Kingdom, United States, and Vietnam.

antiviral agents such as oseltamivir or ribavirin. Steroids have also been given orally or intravenously to patients in combination with ribavirin and other antimicrobials. At present, there is still no recommended etiological treatment for SARS. Ancillary support, especially assisted respiratory ventilation for severe respiratory distress syndrome, continues to be helpful.

The Pan American Health Organization (PAHO) has been disseminating information on the global SARS outbreak and

its clinical, laboratory and epidemiological features to the countries of the Region since its initial developments. PAHO is also supporting countries in the strengthening of preparedness in public health and medical care services for the prevention and control of SARS. In addition, a special reporting mechanism has been established to monitor the situation and trends of SARS in the Americas. The majority of the countries have developed functional, technical, and operational

Box 1: SARS Case Definitions for Surveillance, Revised 1 May 2003

Objective

To describe the epidemiology of SARS and to monitor the magnitude and the spread of this disease, in order to provide advice on prevention and control.

Case definitions

Introduction: The surveillance case definitions based on available clinical and epidemiological data are now being supplemented by a number of laboratory tests and will continue to be reviewed as tests currently used in research settings become more widely available as diagnostic tests.

The document "Preliminary clinical description of Severe Acute Respiratory Syndrome" (available at: <http://www.who.int/csr/sars/clinical/en/>) summarizes what is currently known about the clinical features of SARS. Countries may need to adapt case definitions depending on their own disease situation. Retrospective surveillance is not expected.

Clinicians are advised that patients should not have their case definition category downgraded while awaiting results of laboratory testing or on the bases of negative results.

Suspect case

1. A person presenting after 1 November 2002¹ with history of:
 - high fever (>38 °C) **AND**
 - cough or breathing difficulty **AND** one or more of the following exposures during the 10 days prior to onset of symptoms:
 - close contact² with a person who is a suspect or probable case of SARS;
 - history of travel, to an area with recent local transmission of SARS
 - residing in an area with recent local transmission of SARS
2. A person with an unexplained acute respiratory illness resulting in death after 1 November 2002,¹ but on whom no autopsy has been performed **AND** one or more of the following exposures during to 10 days prior to onset of symptoms:
 - close contact² with a person who is a suspect or probable case of SARS;
 - history of travel to an area with recent local transmission of SARS
 - residing in an area with recent local transmission of SARS

Probable case

1. A suspect case with radiographic evidence of infiltrates consistent with pneumonia or respiratory distress syndrome (RDS) on chest X-ray (CXR).
2. A suspect case of SARS that is positive for SARS coronavirus by one or more assays. (See "Use of laboratory methods for SARS diagnosis", available at: <http://www.who.int/csr/sars/labmethods/en/>).
3. A suspect case with autopsy findings consistent with the pathology of RDS without an identifiable cause.

Exclusion criteria: A case should be excluded if an alternative diagnosis can fully explain their illness.

Reclassification of cases

As SARS is currently a diagnosis of exclusion, the status of a reported case may change over time. A patient should always be managed as clinically appropriate, regardless of their case status.

- A case initially classified as suspect or probable, for whom an alternative diagnosis can fully explain the illness, should be discarded after carefully considering the possibility of co-infection.
- A suspect case who, after investigation, fulfils the probable case definition

Notes:

¹ The surveillance period begins on 1 November 2002 to capture cases of atypical pneumonia in China now recognized as SARS. International transmission of SARS was first reported in March 2003 for cases with onset in February 2003.

² Close contact: having cared for, lived with, or had direct contact with respiratory secretions or body fluids of a suspect or probable case of SARS.

should be reclassified as "probable".

- A suspect case with a normal CXR should be treated, as deemed appropriate, and monitored for 7 days. Those cases in whom recovery is inadequate should be re-evaluated by CXR.
- Those suspect cases in whom recovery is adequate but whose illness cannot be fully explained by an alternative diagnosis should remain as "suspect".
- A suspect case who dies, on whom no autopsy is conducted, should remain classified as "suspect". However, if this case is identified as being part of a chain transmission of SARS, the case should be reclassified as "probable".
- If an autopsy is conducted and no pathological evidence of RDS is found, the case should be "discarded".

Reporting procedures

- All probable SARS cases should be managed in the same way for the purposes of infection control and outbreak containment (See Box 3)
- At this time, WHO is maintaining surveillance for clinically apparent cases only i.e. probable and suspect cases of SARS. (Testing of clinically well contacts of probable or suspect SARS cases and community based serological surveys are being conducted as part of epidemiological studies which may ultimately change our understanding of SARS transmission. However, persons who test SARS Coronavirus (CoV) positive in these studies will not be notified as SARS cases to WHO at this time).
- Where laboratory tests are not available or not done, probable SARS cases as currently defined above should continue to be reported in the agreed format.
- Suspect cases with positive laboratory results will be reclassified as probable cases for notification purposes *only if the testing laboratories use appropriate quality control procedures.*
- No distinction will be made between probable cases with or without a positive laboratory result and suspect cases with a positive result for the purposes of global surveillance. WHO will negotiate sentinel surveillance of SARS with selected partners to collect detailed epidemiological, laboratory and clinical data.
- Cases that meet the surveillance case definition for SARS should not be discarded on the basis of negative laboratory tests at this time.

Rationale for retaining the current surveillance case definitions for SARS

The reason for retaining the clinical and epidemiological basis for the case definitions is that at present there is no validated, widely and consistently available test for infection with the SARS coronavirus. Antibody tests may not become positive for three or more weeks after the onset of symptoms. We do not yet know if all patients will mount an antibody response. Molecular assays must be performed using appropriate reagents and controls under strictly controlled conditions, and may not be positive in the early stages of illness using currently available reagents. We are not yet able to define the optimal specimen to be tested at any given stage of the illness. This information is accruing as more tests are being performed on patients with known exposures and/or accompanied by good clinical and epidemiological information. We hope that in the near future an accessible and validated diagnostic assay(s) will become available which can be employed with confidence at a defined, early stage of the illness.

Source: World Health Organization (WHO).

guidelines through their early warning and response systems to detect, investigate, prevent and control the dissemination of emerging and reemerging infectious diseases.

The global epidemic potential of SARS, should the present pathogenicity and transmissibility of the SARS virus be maintained, will require that countries strengthen their preparedness and promptly respond to the occurrence of any suspected cases of the disease.

For additional and updated information on SARS, please visit the following URLs:

- <http://www.who.int/csr/sars>
- http://www.paho.org/english/ad/dpc/cd/sars_info.htm
- <http://www.cdc.gov/ncidod/sars/>
- <http://www.hc-sc.gc.ca/english/protection/warnings/sars/index.html>

Box 2: Hospital Infection Control Guidance for Severe Acute Respiratory Syndrome (SARS), Revised 24 April 2003

Outpatient/triage setting

- Those presenting to health care facilities who require assessment for SARS should be rapidly diverted by triage nurses to a separate area to minimize transmission to others
- Those patients should be given a face mask to wear, preferably one that provides filtration of their expired air.
- Staff involved in the triage process should wear a face mask (see below) and eye protection and wash hands before and after contact with any patient, after activities likely to cause contamination and after removing gloves
- Wherever possible, patients under investigation for SARS should be separated from the probable cases.
- Soiled gloves, stethoscopes and other equipment have the potential to spread infection.
- Disinfectants such as fresh bleach solutions, should be widely available at appropriate concentrations.

Inpatient setting

Care for probable SARS cases (see Box 1)

- Probable SARS cases should be isolated and accommodated as follows in descending order of preference:
 1. negative pressure rooms with the door closed
 2. single rooms with their own bathroom facilities
 3. cohort placement in an area with an independent air supply, exhaust system and bathroom facilities
- Turning off air conditioning and opening windows for good ventilation is recommended if an independent air supply is unfeasible. Please ensure that if windows are opened they are away from public places.
- WHO advises strict adherence to the barrier nursing of patients with SARS, using precautions for airborne, droplet and contact transmission.
- All staff, including ancillary staff should be trained in the infection control measures required for the care of such a patient.
- A member of staff must be identified who will have the responsibility of observing the practice of others and provide feedback on infection control.
- Disposable equipment should be used wherever possible in the treatment and care of patients with SARS and disposed of appropriately. If devices are to be reused, they should be sterilized in accordance with manufacturers' instructions. Surfaces should be cleaned with broad spectrum disinfectants of proven antiviral activity.
- Movement of patients outside of the isolation unit should be avoided. If moved the patients should wear a face mask.

- Visitors, if allowed by the health care facility should be kept to a minimum. They should be issued with personal protective equipment (PPE) and supervised.
- All non-essential staff (including students) should not be allowed on the unit/ward.
- Handwashing is crucial, therefore access to clean water is essential. Hands should be washed before and after contact with any patient, after activities likely to cause contamination and after removing gloves.
- Alcohol-based skin disinfectants could be used if there is no obvious organic material contamination.
- Particular attention should be paid to interventions such as the use of nebulisers, chest physiotherapy, bronchoscopy or gastroscopy; any other intervention which may disrupt the respiratory tract or place the healthcare worker in close proximity to the patient and potentially infected secretions.
- PPE should be worn by all staff and visitors accessing the isolation unit.
- The PPE worn in this situation should include: A face mask providing appropriate respiratory protection (see below), Single pair of gloves, Eye protection, Disposable gown, Apron, Footwear that can be decontaminated.
- All sharps should be dealt with promptly and safely.
- Linen from the patients should be prepared on site for the laundry staff. Appropriate PPE should be worn in this preparation and the linen should be put into biohazard bags.
- The room should be cleaned by staff wearing PPE using a broad spectrum disinfectant of proven antiviral activity.
- Specific advice concerning air conditioning units will be available soon.
- **Respiratory protection:** Where feasible, this should be provided at *P100/FFP3, or P99/FFP2 filter level (99.97% and 99% efficiency respectively). *N95 filters (95% filter efficiency) also provide high levels of protection and could be worn where no acceptable higher protection alternatives are available, for example for staff working in triage areas, prior to isolation. Ideally, the masks used should be fit tested using an appropriate "fit test kit" in accordance with the manufacturing instructions. Disposable masks should not be reused.

*N/R/P 95/99/100 or FFP 2/3 or an equivalent national manufacturing standard (NIOSH (N,R,P 95,99,100) or European CE EN149:2001(FFP 2,3) and EN143:2000 (P2) or comparable national / regional standards applicable to the country of manufacture.

Source: World Health Organization (WHO).

Box 3: Management of Severe Acute Respiratory Syndrome (SARS), Revised 11 April 2003

These guidelines are constantly reviewed and updated as new information becomes available. They are compiled to provide a generic basis on which national health authorities may wish to develop guidelines applicable to their own particular circumstance.

Please refer to [Box 1](#).

Management of Suspect and Probable SARS Cases

- Hospitalize under isolation or cohort with other suspect or probable SARS cases (see [Box 2](#)).
- Take samples (sputum, blood, sera, urine,) to exclude standard causes of pneumonia (including atypical causes); consider possibility of coinfection

with SARS and take appropriate chest radiographs.

- Take samples to aid clinical diagnosis of SARS including: White blood cell count, platelet count, creatine phosphokinase, liver function tests, urea and electrolytes, C-reactive protein and paired sera. (Pair sera will be invaluable in the understanding of SARS even if the patient is later not considered a SARS case).
- At the time of admission the use of antibiotics for the treatment of community-acquired pneumonia with atypical cover is recommended.
- Pay particular attention to therapies/interventions which may cause aerosolization such as the use of nebulisers with a bronchodilator, chest

physiotherapy, bronchoscopy, gastroscopy, any procedure/intervention which may disrupt the respiratory tract. Take the appropriate precautions (isolation facility, gloves, goggles, mask, gown, etc.) if you feel that patients require the intervention/therapy.

- In SARS, numerous antibiotic therapies have been tried with no clear effect. Ribavirin with or without use of steroids has been used in an increasing number of patients. But, in the absence of clinical indicators, its effectiveness has not been proven. It has been proposed that a coordinated multicentred approach to establishing the effectiveness of ribavirin therapy and other proposed interventions be examined.

Definition of a SARS Contact

A contact is a person who may be at greater risk of developing SARS because of exposure to a suspect or probable case of SARS. Information to date suggests that risky exposures include having cared for, lived with, or having had direct contact with the respiratory secretions, body fluids and/or excretion (e.g. faeces) of a suspect or probable cases of SARS.

Management of Contacts of Probable SARS Cases

- Give information on clinical picture, transmission, etc. of SARS to the contact
- Place under active surveillance for 10 days and recommend voluntary home isolation.
- Ensure contact is visited or telephoned daily by a member of the public

health care team.

- Record temperature daily.
- If the contact develops disease symptoms, the contact should be investigated locally at an appropriate health care facility.
- The most consistent first symptom that is likely to appear is fever.

Management of Contacts of Suspect SARS Cases

As a minimum the following follow up is recommended:

- Give information on clinical picture, transmission etc. of SARS to the contact.
- Place under passive surveillance for 10 days.
- If the contact develops any symptoms, the contact should self report via the telephone to the public health authority.
- Contact is free to continue with usual activities.
- The most consistent first symptom which is likely to appear is fever.

Most national health authorities may wish to consider risk assessment on an individual basis and supplement the guidelines for the management of contacts of suspected SARS cases accordingly.

Removal from Follow up

If as a result of investigations, suspected or probable cases of SARS are discarded (no longer meet suspect or probable case definitions) then contacts can be discharged from follow up.

Source: World Health Organization (WHO).

Related Articles and Reports:

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- World Health Organization. Acute respiratory syndrome China, Hong Kong Special Administrative Region of China, and Vietnam. *Wkly Epidemiol Rec*;78:73-74.
- World Health Organization. Outbreak news – Influenza A(H5N1), Hong Kong Special Administrative Region of China – update. *Wkly Epidemiol Rec*;78(10):65-66.
- World Health Organization. Outbreak News – Acute respiratory syndrome, China – update. *Wkly Epidemiol Rec*;78(9):57-58.

Source: PAHO's Area of Disease Prevention and Control, Communicable Diseases Unit.

Call for Nominations: 2003 Fred L. Soper Award for Excellence in Health Literature

The Pan American Health and Education Foundation, a non-profit US based public foundation and collaborating partner of the Pan American Health Organization (PAHO), is accepting nominations of outstanding scientific journal articles of public health in the Region of the Americas that were published in 2002. The Foundation will grant the winning article the *2003 Fred L. Soper Award for Excellence in Health Literature*.

To be nominated, an article must have been published in a scientific journal that is listed in the *Index Medicus* (MEDLINE) or in the official journals of PAHO. Authors must have a principal affiliation with a teaching, research or service institution located in the Region of the Americas. Preference is given to studies involving more than one discipline and to papers related to infectious diseases. Eligible papers may consist of a report, an analysis of new data (experimental or observational), or a new approach to analyzing available data. The award consists of a certificate of merit and a cash prize of US\$2,500.

Nominations must be received by 30 June 2003.

Information:

Fred L. Soper Award Committee
Pan American Health and Education Foundation
525 Twenty-third Street, N.W. Washington, D.C. 20037

Phone: 202-974-3416 - Fax: 202-974-3636
E-mail: pahef@paho.org
Internet: <http://www.paho.org/English/PAHEF/soper.htm>

Country Profiles

Bolivia

General situation and trends

Bolivia is situated in central South America, in an area of 1,098,581 km². Its population in 2000 was estimated at 8,328,700 inhabitants, with a population density of 7.6 inhabitants per km². The country is divided administratively into 9 departments, subdivided into 112 provinces, with 314 municipalities. As a consequence of the modernization policies, which included passing the Community Involvement Act ("Ley de Participación Popular") and reforming the Constitution in 1994, the degree of participatory democracy was increased by delegating responsibility for municipal management to autonomous governments of equal hierarchy under a council and a mayor elected by universal suffrage.

By 1998, the GDP per capita had risen to US\$1,010, posting 4.3% growth between 1990 and 1998. Mean annual inflation was 10%, declining from 18.0% in 1990 to 3.1% in 1999. The open unemployment rate was down by around 4% in 1999; however, only 48% of the working population in the department capital cities were salaried workers entitled to social protection benefits. The incidence of poverty, measured in terms of income, fell from 80% in 1976 to 60% in 1997. The Gini coefficient for income distribution was 0.53 in 1996 and 0.56 in 1997. In 1997, estimated national illiteracy was 8% among men and 22% among women over 15 years of age, reaching 55% and 52% in rural areas of Potosí and Chuquisaca, respectively. In 1996, the average schooling of the population reached 6.5 years in males and 5.1 years in women.

In the last 50 years, Bolivia's total population has tripled in size. This increase was accompanied by an intense urbanization process. Between 1950 and 2000, the rural population decreased from 65% to 35% of the national population. In 2000, 15% of the population was under 5 years of age, 40% under 15 years, and 59% less than 25 years. The total fertility rate remains high: between 1995 and 2000, women had 4.4 children on average.

Between 1995 and 2000, the annual crude death rate was estimated at 9 deaths per 1,000 population and life expectancy at birth at 61.4 years. Bolivia has not yet managed to

Figure 1: Gross domestic product, annual growth (%), Bolivia, 1990-2000

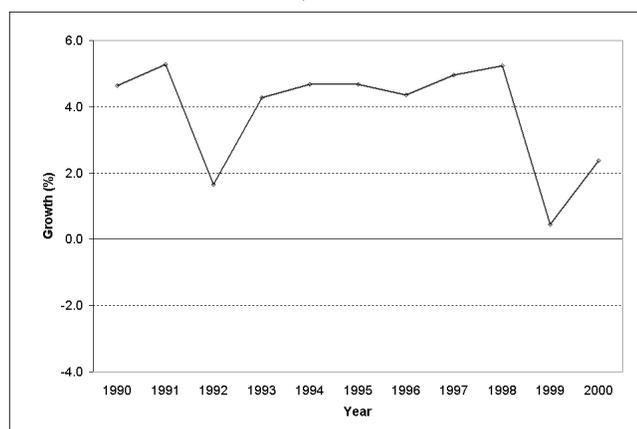


Figure 2: Population structure, by age and sex, Bolivia, 2000

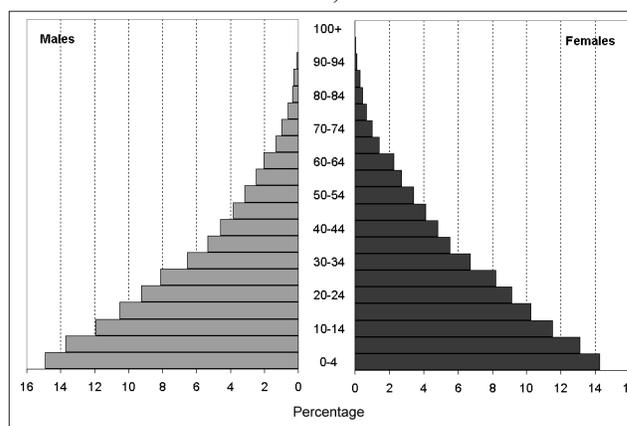
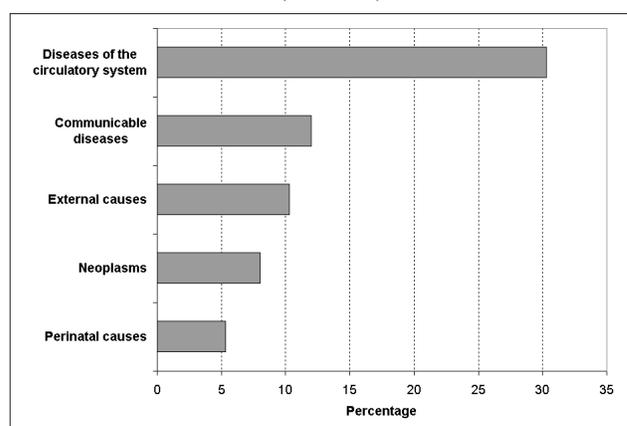


Figure 3: Proportional mortality, by broad groups of causes, Bolivia, 2000



develop a system to record vital statistics. Estimated national underregistration of mortality was approximately 63%. In a mortality study conducted in 2000, it was pointed out that leading broad group causes of mortality were: diseases of the circulatory system (30.3% of deaths), communicable diseases (12.0%), and external causes (10.7%). Close to 11% of all deaths were classified as ill-defined signs and symptoms.

Specific Health problems

BY POPULATION GROUP

Children (0-4 years): The infant mortality rate has declined steadily, from 89 per 1,000 live births in 1988 to 55 per 1,000 in 2000, although in some rural areas it still exceeds 80 per 1,000 live births. Neonatal mortality averaged 34 per 1,000 live births: 57% early neonatal mortality and 43% late neonatal mortality. The mortality rate among children under 5 years declined from 116 per 1,000 live births in 1993 to 79 per 1,000 live births in 2000. Regarding deaths of children under 5 years, 40% corresponded to children less than 1 month old, 37% was attributed to diarrheal diseases, 20% to pneumonias and 16% to perinatal disorders.

Adolescents (10-14 and 15-19 years): In 1994, 37% of adolescent girls were mothers by the time they were 19. In 1998, this proportion had dropped to 27%. Estimates showed that 14-15-year-old girls accounted for 69% of abortions.

Adults (20-59 years): The fertility rate among women with high school or higher education was 2.7 children per woman, whereas this rate increased to 7.1 among uneducated women. In 1994, the maternal mortality rate was estimated at 390 per 100,000 live births (274 in urban areas, 524 in rural areas, and 602 in the rural altiplano).

BY TYPE OF HEALTH PROBLEM

Diseases preventable by immunization: Between 1998 and 2000, a huge measles outbreak spread across the country, with a total of 4,751 suspected cases and 2,567 confirmed cases. The under-5 year age group was the most affected. In 2000, rubella outbreaks behaved in a similar epidemiological manner to the measles outbreak, and 427 cases were confirmed. In July 2000, application of the MMR vaccine against measles, mumps, and rubella was included in the regular EPI scheme for the population aged 12 to 23 months old. Between 1996 and 2000, 5,500 cases of mumps were recorded, of which 2,157 occurred in 1999 and 680 in 2000. Between 1998 and 2000, the rate of cases of acute flaccid paralysis (AFP) reported in children under 15 years old, declined from 11.9 to 7.6 cases per million. In the same period, the indicator for measuring the acceptability of the stool specimen for AFP increased from 58% to 72%. In 1999, four cases of diphtheria were reported among the school-age population and two cases in 2000. The incidence of pertussis has also dropped: in 1996, 115 cases were reported, whereas, in 2000, 10 cases were reported. In 2000, two cases of neonatal tetanus were reported and investigated. In the same year, the national immunization coverage was 94% for BCG among infants under one year of age, 89% for DPT3 and OPV3 vaccines in infants under one year of age, and 100% for anti-measles vaccine in children from 12 to 23 months.

HIV/AIDS and sexually transmitted infections: Between 1985 and 2000, there were 605 cases of HIV/AIDS (52% asymptomatic carrier of HIV). The average annual incidence rate remained around three cases per million population (1990-1997). The male:female ratio decreased from 5:1 to 2:1, and heterosexual transmission predominates. Sentinel surveillance detected

Figure 4: Vaccination coverage among the population under 1 year of age, by vaccine, and tetanus toxoid coverage among women of childbearing age, Bolivia, 2000

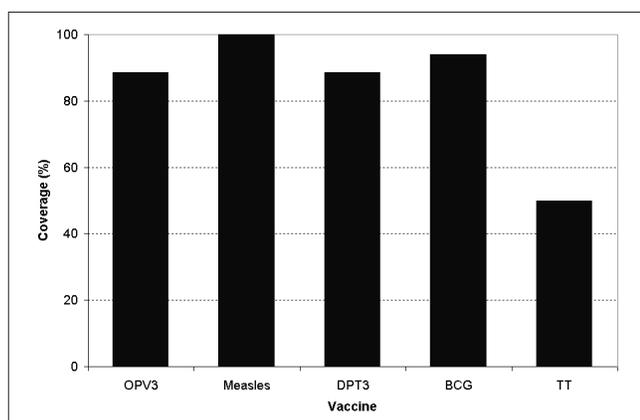
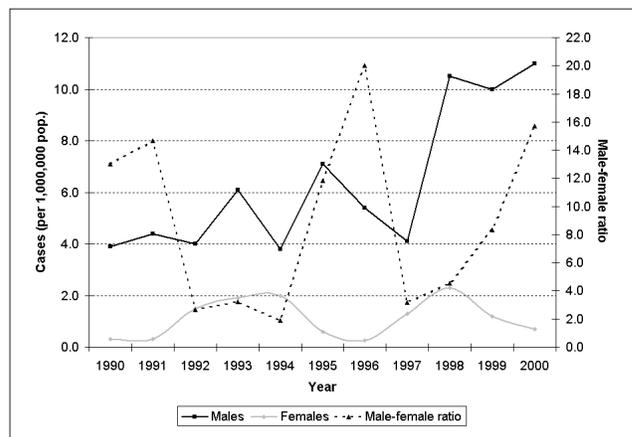


Figure 5: AIDS incidence, by sex, with male-female ratio, Bolivia, 1990-2000



prevalences of HIV lower than 1% in pregnant women and 5% in populations with high-risk behavior, and thus the epidemic was classified as incipient. In 1999, incidence rates of gonorrhoea, syphilis, and hepatitis B in the general population were estimated at 74, 55, and 5 per 100,000 population, respectively.

Intestinal infectious diseases: Bolivia saw 40,212 cases of cholera between 1991 and 1995, resulting in 814 deaths. Since then, there has been a decline in incidence from 2,068 cases in 1996 to 467 in 1998 and no cases in 1999 and 2000.

Vector-borne diseases: In 75% of the national territory, where half the country's population live, malaria is actively transmitted. In 2000, 31,468 *P. vivax* and 2,536 *P. falciparum* malaria cases were reported in contrast with 74,350 and 11,414 cases, respectively, in 1998. The *P. vivax* annual parasite index (API) in 2000 was 8.8 per 1,000 inhabitants, 58% below the figure for 1998. Chagas disease is endemic in 60% of the territory, where 4.0 million inhabitants are at risk. It is estimated that the prevalence of infection by *Trypanosoma cruzi* in the population of the endemic areas is 40%. Between 1996 and 1999, the incidence of jungle yellow fever rose significantly, from 30 cases reported in 1996 to 68 cases in 1999, and then dropped sharply with 8 reported in 2000. In the last decade, the case-fatality rate from yellow fever exceeded 60%. Circulation of dengue virus serotype 1 and occurrence of cases of classic dengue have been documented in Bolivia since 1987. In 1999 and 2000, 27 and 80 cases of classic dengue were identified, respectively. No confirmed cases of hemorrhagic dengue were reported. In 2000, 1,735 cases of leishmaniasis were reported, more than half of these cases in the department of La Paz. Endemic plague was detected in 2000 in La Paz, Santa Cruz, Chuquisaca, and Tarija. In the period 1996-1997, there was an outbreak of human plague in San Pedro Apolo with 17 confirmed cases and 4 deaths. Since then no new cases have been reported in humans.

Zoonoses: During the last decade, cases of human rabies followed an interannual cyclical pattern. The incidence of canine rabies fell from 18.0 per 10 thousand dogs in 1992 to 1.8 in 2000. This drop was linked to the increase in canine rabies vaccination coverage.

Chronic communicable diseases: In 1999, 9,272 cases of all forms of tuberculosis were reported, 12.6% less than in 1996. The number of respiratory symptom cases detected fell by

13% between 1996 (71,959 cases) and 1999 (62,371 cases), and the number of diagnostic sputum smears by 14.1% (from 133,316 to 114,564) in the same period. Ever since the directly observed treatment, short course strategy (DOTS) was applied in some areas in 1994, the case-finding coverage has not exceeded 60%. The cure rate has not exceeded 70% among those who began treatment, with treatment incompleteness rates ranging from 10% to 12%. In the last years, a decline in the number of prevalent cases of leprosy was observed: from 1,179 in 1993, to 607 in 1997 and 379 in 2000. The prevalence rate of leprosy was 5.3 cases per 100,000 population, with 82 new cases reported (64 males) in 2000.

Nutritional and metabolic diseases: In 1998, the prevalence of chronic malnutrition in children under three was 26%, but it was 36% in rural areas, and 44% among children with illiterate mothers. In the same age-group, the prevalence of anemia was 67%. Iron deficiency is the main cause of anemia and one of every three women of childbearing age is anemic. The prevalence of iodine deficiency disorders was reduced from 61% in 1981 to 5% in 1995. In the country's main cities - La Paz, El Alto, Santa Cruz and Cochabamba - the prevalence of diabetes mellitus was 7.2% (7.6% in women and 6.8% in males), and as high as 20% in individuals aged 60-64 years in some cities. In these cities, the prevalence of hypertension was 18.6%: 16% in women and 21% in males.

Oral health: In 1998, the prevalence of untreated caries at 12 years of age was 84.6%. The DMFT index at this age was 4.7, with a caries component of 93%.

Natural disasters: In 1997-98 the most serious consequences have been linked to the effects of the El Niño phenomenon: 40 (1997) and 75 (1998) deaths, and US\$ 1,364 million in economic impact for both years.

Emerging and re-emerging diseases: The first confirmed case of hantavirus pulmonary syndrome was reported in 1998 in Tarija, and the second in 1999 in Santa Cruz. Neither of the two was fatal. In May 2000 in Tarija, there was an outbreak of five cases among men 15-54 years of age, with four deaths. No Bolivian hemorrhagic fever cases were reported from 1997 to 1999. In 2000, the only case reported was in Beni and it was fatal.

Response of the health system

NATIONAL HEALTH POLICIES AND PLANS

The 1997-2000 Strategic Health Plan is designed to develop the Bolivian health system and ensure universal access through individual, family, and community primary health; an "epidemiological shield"; short-term basic and social insurance; and promotion of healthy municipalities, subject to participation of and control by society. It adopts the sectoral decentralization guidelines provided for in the 1994 Community Involvement Act.

HEALTH SECTOR REFORM STRATEGIES AND PROGRAMS

The main strategy behind the sectorial reform process is the Basic Health Insurance (BHI), an instrument designed to guarantee all inhabitants permanent access to a series of promotional, preventive, and curative health benefits, which are essential to mitigate the consequences of the main causes of disease and death in the country, at a sustainable cost. This system provides health care and nutrition for children under 5 years; immunization and promotion of nutrition; and attention to priority problems in the mortality profile, including diagnosis and treatment of the country's principal endemics:

tuberculosis, malaria, cholera and sexually transmitted infections. The debt relief program for heavily indebted poor countries in which Bolivia participates proposes monitoring four performance indicator goals: delivery care coverage (69%); coverage for treatment of acute respiratory infection in children under 5 years old (70%), acute diarrheal disease in children under 5 years old (56%) and DPT3 immunization coverage in infants under 1 year of age (85%). By the year 2000, these coverages were 50%, 87%, 36%, and 86%, respectively.

THE HEALTH SYSTEM

Bolivia's health system comprises public and private for-profit and not-for-profit sectors, and the social security system. The Ministry of Health and Social Welfare (MSPS) is responsible for sectoral regulation, and for issuing and applying policies and national standards. The delivery of health care services is under administrative responsibility of municipal government. Approximately 43% to 48% of the population uses the public services of the BHI. Social security funds account for 22% of coverage, and the private sector for 10%. Between 20% and 25% of the population lacks access to health services.

ORGANIZATION OF PUBLIC HEALTH CARE SERVICES AND PROGRAMS

Disease prevention and control: The "epidemiological shield" strategy vertically integrates the activities of priority programs for the surveillance, prevention and control of malaria, Chagas disease, tuberculosis, yellow fever, leishmaniasis and diseases preventable by immunization, and articulates itself with the BHI. The prevention and control of acute respiratory infection, acute diarrheal disease, sexually transmitted infections, cervical cancer, other chronic and degenerative disorders, nutritional disorders, and domestic violence is part of the national health care program.

Health analysis, epidemiological surveillance and public health laboratory systems: The National Epidemiological Surveillance and Health Situation Analysis System was set up in 2000. This system includes mortality, morbidity, nosocomial infections, risk factors, environmental surveillance and basic indicator data. The National Institute of Laboratories of Health and the Center of Tropical Diseases are national referral laboratories that contribute to the network of the surveillance system which includes 248 clinical analysis laboratories. The National Health Information Subsystem is a component of the National Statistical Information System, which prepares information on the production and productivity of health services in the country.

Potable water and excreta disposal services: In 1999, 72% of the population had access to potable water services (93% urban; 37% rural) and 61% had access to sanitation and excreta disposal services (79% urban; 33% rural).

ORGANIZATION OF INDIVIDUAL HEALTH CARE SERVICES

The country has 3,165 health care establishments of varying complexity and a total of 12,554 hospital beds that are part of a national health care service network of the Basic Health Insurance benefit package. In 1999, there were 23,415 blood units donated in the 60 registered blood banks. A total of 90% of the donations were replacement donations by family members and 80% were screened. In these units, positive markers of *T. cruzi* (17.5%), syphilis (7%), hepatitis C (1.2%), and hepatitis B (0.5%) were detected. In 1998, Free Medical Insurance for Senior Citizens was established that guarantees adults over 60 access to public health services and social security.

HEALTH SUPPLIES

In 1999, US\$ 98.5 million equivalent to US\$ 12.1 per capita were spent on drugs. In that year, 77.5% of drug expenditure came from out-of-pocket expenditure. The pharmaceutical sector is an important segment of the country's economy, accounting for 1.15% of GDP. There are 8,293 legally registered drugs, 5,518 of which are marketed. Of these, 27% are essential drugs and 70% are imported drugs.

HUMAN RESOURCES

In 1999, the MSPS had a staff of 13,850 people: 27% nursing auxiliaries, 26% administrative and service personnel, 18% physicians, 14% technicians, 9% professional nurses and 6% other professionals. Problems of imbalance persist between human resources available and the tasks required to solve problems, due to an 'irrational' ratio between administrative and medical personnel, imbalance in types of training, and low remuneration of medical and paramedical staff.

HEALTH SECTOR EXPENDITURES AND FINANCING

National health expenditure amounted to US\$ 422 million in 1998. That amount represented 5% of the GDP and was equivalent to US\$ 46 per capita per annum. Public health expenditure accounted for 65% of the national spending on health (42% to social security; 23% to the public sector). Between 1995 and 1998, the main sources of sectoral financing are from the country's companies (45%), consumers (31%), and government (17%).

EXTERNAL TECHNICAL COOPERATION AND FINANCING

Through a loan agreement signed with the Inter American Development Bank, the government of Bolivia is developing the 'epidemiological shield' project and the 1999-2004 Support for the Reform of the Health Sector Project, equivalent to US\$ 54 million. The country also signed a US\$ 28 million loan agreement with the World Bank for the first phase of the 1999-2001 Support for the Reform of the Health Sector Project, with the objective to reduce national maternal and infant mortality rates.

Guyana

General Situation and Trends

Guyana covers an area of 215,000 km² and is located along the northeastern coast of South America. It is divided into 10 administrative regions with Regional Democratic Councils responsible for the delivery of services to their catchment population. Guyana is rich in natural resources; its economy is based on agriculture (primarily sugar and rice), gold, bauxite and timber.

The estimated mid-year population in 2000 was 743,004 persons. Data from the 1999 Guyana Survey of Living Conditions showed that East Indians accounted for 48% of the population. The next largest ethnic group was Negro/Black accounting for 27% of the population; Amerindians were estimated to comprise 6.3% of the population. Females accounted for some 51% of the total population, and for 53% of the population over age 60. Data from the Survey estimated that approximately 30% of the population live in urban areas, and of the 70% that live in rural areas, 61% live in coastal areas. The crude birth rate declined from 24.1 per 1,000 population in 1998 to 23.2 in 1999. The crude death rate remained nearly constant—6.5 in 1998 and 6.6 in 1999. Life expectancy at birth was 64.4 in 1999. Adult literacy was 98%, with no significant gender difference.

In 1999, the GDP per capita was US\$800. The rate of inflation increased from 4.8% in 1998 to 7.4% in 1999. Economic setbacks have been attributed to several factors, including El Niño (which caused drought in some parts of the country and adversely affected agricultural output), and reduced commodity prices on international markets. Thirty-six percent of the population live in absolute poverty (less than US\$510/year) and 19% live in critical poverty (less than US\$364/year). The National Development Strategy which was drafted in 1996 and revised in 2000 has for its objective the attainment of the highest economic growth rates possible, the elimination of poverty, and the diversification of the economy.

A total of 5,302 deaths were registered in 1998 and 5,102 in 1999. The male to female ratio in 1999 was approximately

Figure 1: Population structure, by age and sex, Guyana, 2000

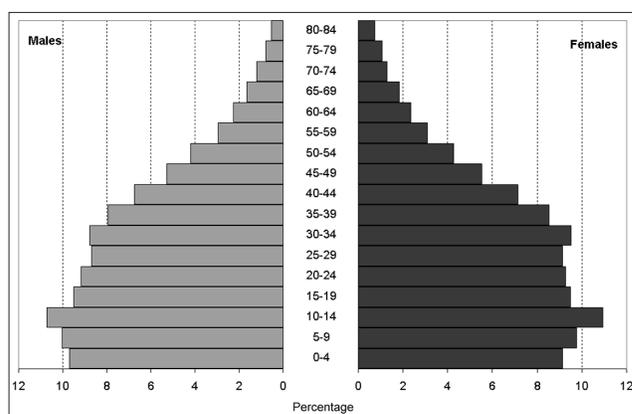


Figure 2: Gross Domestic Product, annual growth (%), Guyana, 1991-2000



1.47:1. Most of the deaths (18%) occurred in the over 75 age group, followed by 16% in the 65-74, and 14% in the 55-64 age groups. Children under 5 years of age accounted for 9.5% of deaths with 71% of these being children under one year. In the period 1997-1999, the leading causes of mortality for all age groups combined were cerebrovascular disease (12.0%), ischemic heart disease (10.0%), Acquired Immune Deficiency Syndrome (7.0%), underdetermined injury (6.6%), diabetes mellitus (6.0%), acute respiratory infections (6.0%), diseases of the pulmonary circulation (6.0%), hypertensive disease (4.8%), intestinal infections (3.4%), and chronic liver diseases (2.8%).

Specific health problems

BY POPULATION GROUP

Children (0-4 years): There were an estimated 17,093 live births in 1999, compared to 19,118 in 1998. The infant mortality rate for 1998 was 23 per 1,000 live births. The neonatal death rate was 13 in 1999. In 1999, Yellow Fever vaccine was introduced into the routine immunization schedule for children aged 12-23 months. The coverage in 2000 was 85%. In 1999, there were 280 deaths in the under-1 age group population compared with 422 in 1998. For the period 1997-1999, hypoxia (21%), intestinal infections (18%), and other perinatal conditions (13%) were among the leading causes of death. In 1999, there were 116 deaths in the 1-4 age group compared to 105 in 1998. Infections and trauma played an important role in the mortality of this age group. In the period 1997-1999, the leading causes of death were intestinal infectious diseases (21%), acute respiratory infections (17%) and undetermined injury (13%). In 1999, the main reason for infant visits to outpatient clinics at hospitals and health centers were acute respiratory infections (56%).

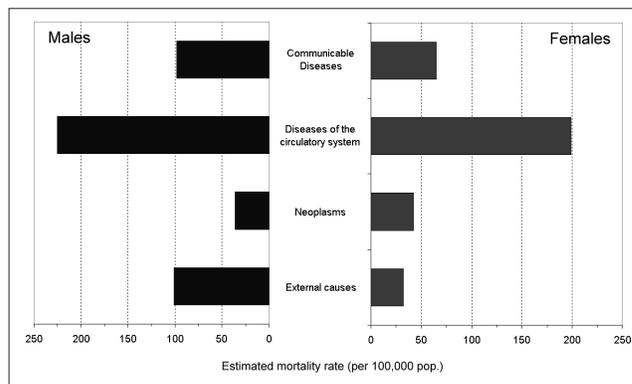
Schoolchildren (5-9 years): In 1999, there were 38 deaths; nine were from communicable diseases and 6 were due to intestinal infections. There were 5 deaths due to neoplasms and 10 due to external causes.

Adolescents (10-14 and 15-19 years): There were 445 deaths in this age group in 1999. Sixteen were from external causes, of which motor vehicle accidents accounted for four, and there were three deaths each from suicides, homicides, and undetermined injury. In 2000, the 15-19 group represented 10% of the population. In 1998 and 1999, 22% and 24%, respectively, of births occurred in women in this age group. Of the women attending government family planning clinics in 1998, 12% were under 20 years.

Adults (20-59 years): The total fertility rate was stable at 2.0 children per woman of child-bearing age between 1997 and 1999. In 1999, 82% of women attended clinic for the first time after the 12th week of pregnancy. The maternal mortality rate was 124.6 per 100,000 live births in 1998. The main causes were haemorrhage (27%), toxemia of pregnancy (21%) and abortion (18%). During 1999, there were 1,813 deaths occurring in this population group. Of these, 22% were due to external causes, 20% to diseases of the circulatory system, and 9% to communicable diseases. AIDS was the leading cause of death, accounting for 15% of deaths in that age group.

The Elderly (60 years and older): This represents 6% of the population, and 53% of them were female. In 1999, this population group accounted for 16,795 visits to hospitals' outpatient clinics. The main diagnoses for first visits were hyper-

Figure 3: Estimated mortality, by broad groups of causes and sex, Guyana, 1995-2000



tension (25%), arthritis/rheumatism (10%), diabetes (8%), acute respiratory infections (10%), and accidents and injuries (5%). There were 1,759 deaths in this age group in 1999. The leading causes of death were chronic non-communicable diseases, including cerebrovascular disease (15%), ischaemic heart disease (15%), diabetes (9.7%), and hypertensive disease (9.2%).

Workers health: In 1999, the total number of accidents reported to the Occupational Safety and Health Division was 2,385, including 2,370 non-fatal accidents. The fatal accidents ranged from 9 in 1997 to 15 in 1999. Eighty-six percent of the non-fatal accidents in 1999 occurred in the agriculture sector.

Indigenous groups: The highest number of Amerindians (about 15,000) were among the Arawaks (or Lokonas). They are followed by the Makushi (7,500 persons), the Wapishana, the Warao, the Akawaio and the Patamona. The 1999 Survey of Living Conditions shows that 78% of Amerindians are among the poorest. Some of the health-related problems they face include malaria (60% of all cases), diarrhoeal diseases, acute respiratory infections, teen pregnancy, short child-spacing, tuberculosis, dental caries and inadequate access to health care. A study conducted in 1997 among the Patamona and the Wapishana tribes showed that the prevalence of stunting increased with age, from 17% at age 7 to 50% at age 13 among the Wapishana tribe while the figures for the Patamona were 19% and 80%, respectively. However, by age 18, fewer than 1% of adults have a BMI of less than 18.5kg/m, while 11% and 3% of adults among Patomona and Wapishana tribes, respectively, were overweight.

BY TYPE OF HEALTH PROBLEM

Vector-borne diseases: Malaria is a major public health problem in Guyana. *Plasmodium falciparum* is the main infectious agent transmitted. New cases represent over 90% of the cases detected each year. In 2000, the number of new cases was 28,267. There were 34 reported cases of dengue fever in 1998, 6 in 1999, and 25 in 2000. There has been laboratory diagnosis of Dengue Types 1 and 2 during 1997-2000. However, no cases of Dengue Haemorrhagic Fever or Dengue Shock Syndrome have been reported. There were 15 reported cases of leptospirosis during 1997-2000.

Diseases preventable by immunization: In 1997, there were 144 confirmed cases of rubella in comparison with 2 cases in

1998. There were two serologically confirmed cases of Congenital Rubella Syndrome in 1997, two in 1998, and one suspected case in 1999 but the serological test for rubella was negative.

Chronic communicable diseases: In 1997, there were 381 cases of tuberculosis with an incidence rate of 48 per 100,000 population, while the rate in 1999 was 53. The largest number of new tuberculosis cases occurred in young adults aged 20-40 with peak incidence in those aged 25-34. Males were more affected than females, accounting for more than 70% of reported cases. In 1999, there were 43 new patients diagnosed with Hansen's Disease and 66 were on treatment.

Acute respiratory infections (ARI): In all age groups from under 1 to 44, they were the leading reasons for outpatient visits in 1999. The mortality rates per 100,000 population were 36.5 in 1997 and 41.0 in 1999. ARIs were the third cause of mortality in the under-1 age group in 1999. They were the second cause of mortality in the 1-4 age group in the period 1997-1998.

HIV/AIDS: During 1997 and 2000, there were 763 reported cases of AIDS. Females accounted for 39.6% of the cases. Most cases (65%) occurred between the ages 20-44. There were 24 cases in the 1-4 years age group. In 2000, 97% of the total reported cases were due to unprotected heterosexual sex compared to 86% in 1999. By 2000, AIDS had become the third leading cause of death.

Sexually transmitted infections: Syphilis was diagnosed in 410 persons in 1998, 315 in 1999, and 534 in 2000. In the period 1997-2000, there were 4 deaths from syphilis. In 1999, 223 pregnant women had a positive VDRL.

Nutritional and metabolic diseases: Protein-energy malnutrition, iron-deficiency anaemia, and obesity remain the major nutrition-related problems in the population. The findings of the 1997 national micronutrients survey revealed that anemia affected 40-55% of children, adolescents and adults. In 1999, there were 118 reported deaths from nutritional deficiencies; twenty-two of these occurred in infants under 1 year old. In 1999, diabetes mellitus accounted for 4,965 first visits and 13,585 total visits to outpatient clinics. There were 290 deaths, representing approximately 7% of all deaths. Of these, 4.9% occurred among males and 9.9% among females.

Diseases of the circulatory system: In the age group 45-64, ischemic heart disease was the leading cause of death. The mortality rate for males was 271 per 100,000 in 1997 and 262.9 in 1998. For females, they were 127.8 in 1997 and 126.6 in 1998. Cerebrovascular disease was the second cause of death. In the age group 65 and over, cerebrovascular disease was the leading cause of death with rates of 1,225.9 per 100,000 in 1997 and 1,142.7 in 1998. Ischaemic heart disease was ranked second. In 1999, there were 199 deaths from hypertensive disease.

Malignant neoplasms: During 1997, 1998 and 1999, there were 370, 359, and 348 deaths, respectively from malignant neoplasms. In men, cancer of the prostate was the leading cause of death accounting for 11% of cancer mortality. For women, cancer of the cervix uteri was the main cause of death, representing 13% of all cancer mortality. Next in rank for all cancers were those of the stomach (8.8%), breast (8.9%), colon (6.9%), and lung and trachea (6.4%).

Accidents and violence: In 1997, there were 611 deaths attributed to external causes, 619 in 1998, and 595 in 1999. Sui-

Figure 4: Vaccination coverage among the population under 1 year of age, by vaccine, and tetanus toxoid coverage for women of childbearing age, Guyana, 2000

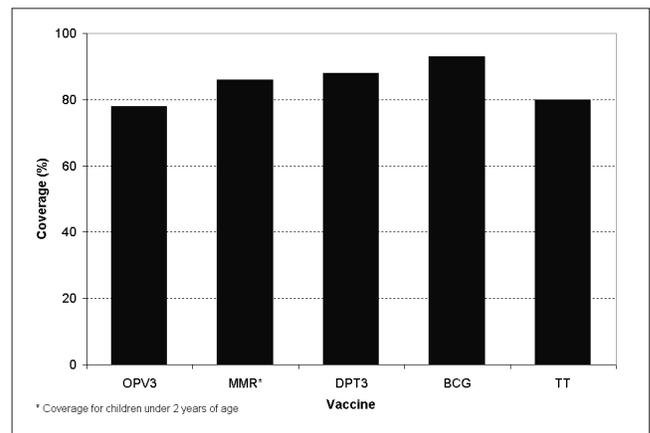
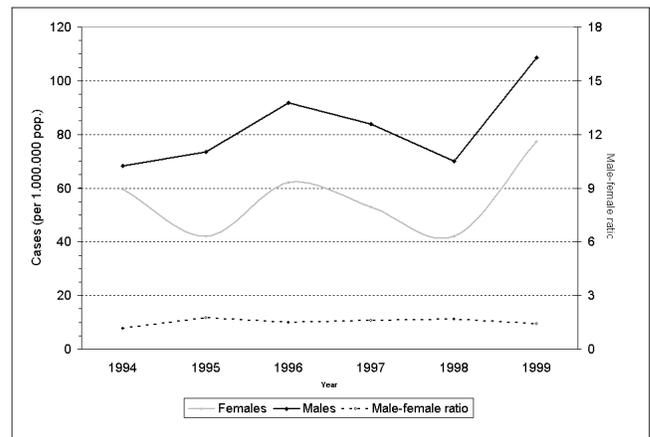


Figure 5: AIDS incidence, by sex, with male-female ratio, Guyana, 1994-1999



cides accounted for 13% of deaths, accidental falls for 12%, and motor vehicle accidents for 9.7%.

Emerging and re-emerging diseases: In 1999, there was an outbreak of equine encephalitis. Twelve deaths were reported.

The Response of the Health System

NATIONAL HEALTH POLICIES AND PLANS

Some elements of the Draft National Plan that was developed for the period 1995-2000 have been implemented. These relate to the prevention of blindness, malaria prevention and control, nutrition, and HIV/AIDS. The plan sought to incorporate the work of both private and public health sectors with the objectives of strengthening and expanding primary health care; improving secondary care in the hospitals; improving tertiary care at Georgetown Public Hospital; and strengthening the general management of the health sector.

HEALTH SECTOR REFORM STRATEGIES AND PROGRAMS

Guyana has embarked on its Health Sector Reform Programme, which proposes the separation of institutional direction and regulation functions for health care provision. A restructured Ministry will emphasize policy development; allocation of resources and developing sustainable financing; performance evaluation; regulation; research and development; and objec-

tive setting. In 1998, the Government initiated the Health Sector Policy and Institutional Development Programme.

THE HEALTH SYSTEM

The Ministry of Health has overall responsibility for the population's health, including policy formulation, standard setting, and monitoring and evaluation. The Ministry of Local Government is responsible for financing and providing services at the regional level. The National Insurance Scheme provides some health benefits to employed persons. The private sector functions independently, and NGOs are actively involved in health care delivery.

Developments in Health Legislation: There is a new impetus to pass legislation to support the reforms. Legislation was passed to establish the Georgetown Public Hospital Corporation and make it a semi-autonomous agency. Legislation to amend the Medical Practitioner Act was approved by Parliament in 2000.

Decentralization of Health Services: In 1986, the regions assumed responsibility for health care within their boundaries. Regional Health Officers report administratively to the Regional Executive Officers, but receive technical and professional guidance from the Ministry of Health. The national referral hospital in Georgetown now functions as a semi-autonomous body with its own board. The private sector provides approximately half of all curative services, some of which (like Mammography) are not available in the public sector. Most private sector services are provided in the capital and other urban centers.

Health insurance: The National Insurance Scheme operated a social insurance program for employees. The Scheme provides sickness (not employment related), maternity, medical care, and job-related injury benefits. Medical coverage is provided, on a reimbursable basis, for selected services. Some employers provide additional contributory or non-contributory insurance for their employees. In other cases, individuals purchase health insurance from private insurance companies.

ORGANIZATION OF REGULATORY ACTIONS

The Ministry of Health is responsible for the regulation of health policies and legislation, the establishment and enforcement of standards for the delivery of health care, and the protection of public health. The Ministry's Directorate of Standards and Technical Services is responsible for the development of standards, as is the Bureau of Standards and the Pharmacy and Poison Board. The Environmental Protection Agency has overall responsibility for the protection of the environment.

Certification and professional health practice: Professional councils such as the Guyana Medical Council, the Dental Council, and the Guyana Nursing Council regulate professional health practice. Continuing medical education is required for annual registration of doctors. Guyana is involved in CARICOM efforts to establish common standards and measures for accreditation within the Caribbean Region.

Basic health markets: The Director of Procurement is responsible for procuring drugs and medical supplies and for setting quality standards.

Environmental quality: Guyana established its Environmental Protection Agency in 1996. The Agency is charged with

managing Guyana's diverse physical environment. It has been delegating functions to other agencies involved in environmental management, such as the Geology and Mines Commission, the Guyana Forestry Commission, the Ministry of Local Government, and the Ministry of Health.

Food quality: A number of agencies have regulatory responsibility for food quality. Guyana's six municipalities have various by-laws to monitor food processing and food service sectors in their respective areas.

ORGANIZATION OF PUBLIC HEALTH CARE SERVICES

The Ministry of Health has endorsed the principles and strategies in the Caribbean Charter for Health Promotion.

Disease Prevention and Control Programs: The priorities include maternal and child health, the Expanded Program on Immunization (EPI), HIV/AIDS and other STIs, malaria, and chronic non-communicable diseases.

Health Analysis, Epidemiological Surveillance, and Public Health Laboratory Systems: The Epidemiology Division of the Ministry of Health has overall responsibility for disease surveillance. However, the system faces logistical and communications challenges. The surveillance system for the EPI is the most developed in the country.

Potable water, excreta disposal and sewerage services: Drinking water coverage in all areas of the country is estimated to be 70% with 54% of households having piped water. Quality remains an issue. Sanitation coverage throughout the country has been estimated at 90%, with 18% having access to flush systems and 80% using pit latrines.

Solid waste services: Local government bodies are responsible for solid waste management in Guyana. In 1997, refuse collection in Georgetown was privatized.

Food safety: The Environmental Health Department, within the Ministry of Health, is responsible for ensuring that proper standards are maintained by the food protection and control services at the regional level.

Food aid programs: Food supplements are distributed to pregnant women and young children attending public health clinics in selected high-risk communities. A number of community-based organizations are involved in implementing on-site feeding programs.

ORGANIZATION OF INDIVIDUAL HEALTH CARE SERVICES

Health services are provided at five different levels in the public sector. There are 3,274 hospital beds (4.4 beds per 1,000 population) in the private and public sectors.

Auxiliary diagnostic services and blood banks: Laboratories exist at the regional and national levels. In the public sector, blood for transfusion is screened for hepatitis B and C, HIV, malaria, and syphilis.

Specialized services: Reproductive health care is provided by the public, private and nongovernmental sectors. The Safe Motherhood Initiative is also being implemented. The number of public facilities offering dental care on a daily basis increased from 14 in 1997 to 22 in 2000, and dental education activities have been increased. The psychiatric hospital provides in- and outpatient care. The Rehabilitation Services have been strengthened.

HEALTH SUPPLIES

Although there is a local drug manufacturer, most of the drugs used in Guyana are imported. Guyana does not produce any vaccines or biologicals. Vaccine cold chain facilities exist at all levels of the health services.

HUMAN RESOURCES

In the public health sector, staff vacancy rates range between 25% and 50% in most categories. There is a continuing loss of trained personnel from the public to the private sector and to other countries. From 1997 to 1999, the number of physicians ranged from 3 to 4 per 10,000 population. During the period 1997-1999, nurses ranged from 7 to 15 per 10,000 population, pharmacists were approximately 2 per 10,000 pop., and dentists remained at 0.4 per 10,000 pop.

HEALTH SECTOR EXPENDITURE AND FINANCING

Government health expenditure in 1997 was US\$ 19,318,104 or US\$ 26 per capita; however, the distribution of resources among establishments was not equitable.

EXTERNAL TECHNICAL COOPERATION AND FINANCING

Financial support for Guyana's health sector is channeled through the national budget. The main donor agencies include the IDB, the European Union, CIDA, PAHO, UNICEF, and UNDP. In 1997, external funding covered approximately 12% of total government spending on health, 15% of public sector needs, and some 10% of total private and public health expenditures.

Haiti

General situation and trends

Haiti occupies the western third of Hispaniola, the second largest island in the Caribbean. Its nine departments occupy a land area of 27,700 km². The first country to declare its independence in the Americas, Haiti's recent past has been marked by political and social violence. After several years of political conflicts, elections were held in 2000 for municipal officials, new deputies, senators, and finally, the presidency.

The 1990s saw a worsening of poverty for the Haitian population. In 1999-2000, the growth in the GDP was 1.2%, a decrease compared to the previous period that is mainly explained by the decline in the contribution of the agricultural sector (-1.3%). Inflation was estimated at 15% in 1999-2000 and during the same period the price of food increased 10.4%. A survey conducted in 1999-2000 found that 67% of the population was living in poverty, that 31.4% of the households had more than seven members and that 46% of families had only one room to sleep in.

The official languages are Haitian Creole and French, the latter being used to a large extent in the cities. The population in 2000, based on the census of 1982, was estimated at 7,958,964 for a density of 282 inhabitants per km². The estimated annual population growth rate during 1995-2000 was 2.1%. Sixty-four percent of the people live in the countryside, 21% in the metropolitan area of Port-au-Prince, and 15% in other urban areas. Forty percent of the Haitian population is under 15 years old, and only 5% is over 65. The population dynamic has been characterized by a progressive urbanization, emigration to countries abroad and a shifting population toward the neighboring Dominican Republic.

A sizable percentage of professionals and qualified technicians contribute to the Haitian diaspora, especially the United States (Florida and New York), Canada and neighboring islands. The monthly remittances sent to families in Haiti account for 8.3% of household income. The crude birth rate was 33 per 1,000 population, and the general fertility rate was 4.4 children per woman. Life expectancy at birth was 54.4 years for the general population (52.8 for men, 56 for women).

Since 1997, the Ministry of Public Health and Population (MSPP) and PAHO have been promoting the certification of deaths. In 1999, a total of 7,997 death certificates were

issued, believed to represent 10% of all deaths. Although almost half the certificates show ill-defined causes of death, the information gained allowed a mortality profile to be defined. Communicable diseases headed the list, representing 37.5% of deaths presenting a defined diagnosis. The second most important group was diseases of the circulatory system. External causes ranked third (4.3%) and neoplasms were

Figure 1: Gross Domestic Product, annual growth (%), Haiti, 1991-2000

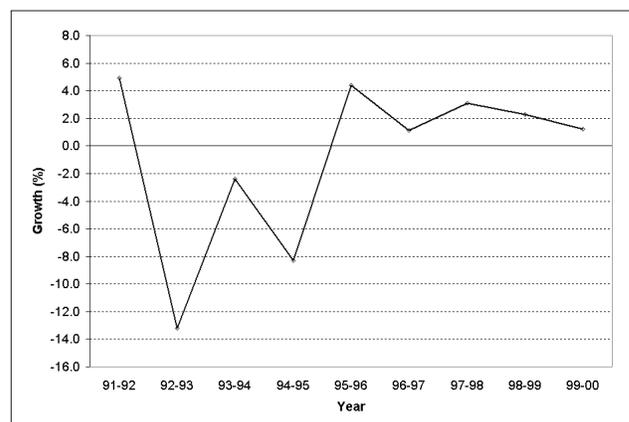
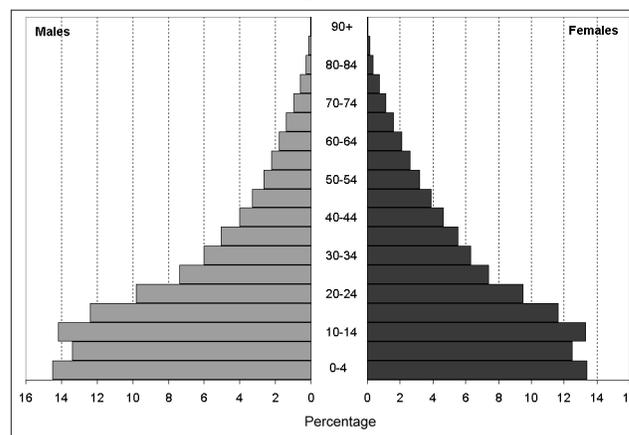


Figure 2: Population Structure, by age and sex, Haiti, 2000



in fourth place (2.7%). In terms of specific causes of death, AIDS ranked first, with 5.2% of the total deaths, followed by diarrhea and infectious gastroenteritis (5%) and cerebrovascular accidents (3.5%). Of the 10 leading causes of death in women, the first three coincide with the general pattern, but maternal causes come fourth, with 157 deaths.

Specific health problems

BY POPULATION GROUP

Children (0-4 years): Infant mortality increased from 73.8 per 1,000 live births in 1996 to 80.3 in 2000. The rise is associated with increased poverty, deficiencies in the health system, and the impact of the AIDS epidemic. Acute diarrheal disease is the number-one health problem in children. The leading causes of death in 1999 were intestinal infectious diseases (12.1%), infections of the perinatal period (10.2%), malnutrition (9.1%) and acute respiratory infections (6.9%).

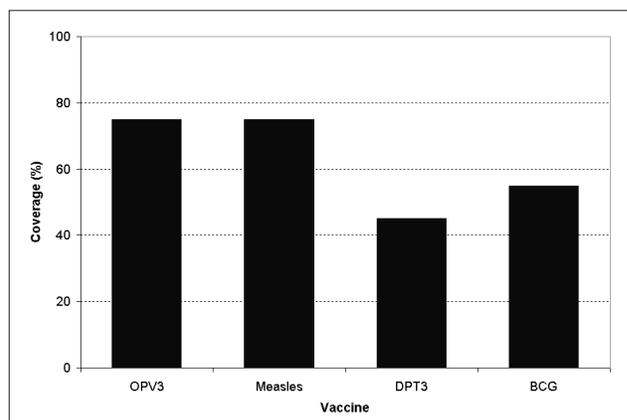
Schoolchildren (5-9 years): An estimated 20% of the group under 15 years old are in a state of vulnerability, i.e. living in poverty, undernourished, with limited access to education, residing in foster homes where they do domestic work (a situation referred to as *restavek*), or else in the street. In the age group 5-14 years, infectious and parasitic diseases accounted for 24% of the registered deaths. External causes represented 10% of all causes of death.

Adolescents (10-14 and 15-19 years): According to death certificates for 1999, adolescents and youth accounted for 8% of the deaths in the country. HIV/AIDS was the leading cause of death in this age group (5.8% of all certified deaths). Among the 10 leading specific causes of death on this population group were assault and homicide, tuberculosis, typhoid, and causes related to maternity (35 maternal deaths in the age group 10-24 years in 1999). The fertility rate in girls aged 15-19 years was 80 per 1,000 in 2000. The prevalence of sexually transmitted infections in adolescent males 15-19 years old was 9.9%. In one survey, 18% of the females and 33% of males stated that they had used a condom in their last sexual encounter. Violence and sexual abuse are very frequent in this population group (70% of adolescent girls and women have been exposed to violence of some sort).

Adults (20-59 years): The fertility rate is in decline, estimated at 4.7 children per woman in 2000. Of all women with a regular partner in 2000, 22% were using a modern method of contraception and 5.8% a traditional method. AIDS is the leading cause of death for the population 15-49 years of age (21.6% of deaths with specifically defined diagnosis). Intestinal infections come second and maternal causes rank third. The maternal mortality rate in 2000 was 523 per 100,000 live births, a 15% increase relative to 1995. Maternal causes of death included problems related to arterial hypertension and eclampsia, as well as complications of labor. Seventy-eight percent of pregnant women had prenatal checkups with a health professional in 2000.

The Elderly (60 years and older): There is no definite social security policy for this population group, nor specific health programs for older adults despite efforts by the State. In 1999 the causes of death were mainly noncommunicable diseases. Diseases of the circulatory system accounted for 39% of the deaths with a valid diagnosis. Malignant neoplasms of the digestive organs, along with tuberculosis and HIV/AIDS, were among the 10 leading specific causes of death.

Figure 3: Vaccination coverage among the population under 1 year of age, by vaccine, Haiti, 2000



Family health: Constant displacement and migration abroad are causing the family structure to break down in urban and rural areas. There are no programs geared to family health.

Workers' health: The informal sector (mainly women) and the agricultural sector make up 96% of the working class. No services are provided for this informal sector. Government workers have a poorly organized insurance system, while the health of employees in the private sector comes under the responsibility of the Office of Medical Insurance and Maternity. In 1999-2000, the indemnity for temporary incapacity or permanent disability was paid to 559 persons, 90% of them men.

The disabled: It was estimated in 1998 that 7% of the Haitian population had some form of disability, half of them occurring in children under 15 years of age. Blindness was the most frequent disability (1% of the population).

Border population: A socioeconomic survey conducted in communities of sugar cane workers in the Dominican Republic showed that 27.5% of the mothers stated that they were of Haitian or Dominican-Haitian origin. The survey found that 20% of children under 5 years with Haitian mothers were suffering from moderate or severe malnutrition.

BY TYPE OF HEALTH PROBLEM

Natural disasters: Haiti is susceptible to hurricanes because of its geographic location. Because of the severe deforestation throughout the island, even normal rains can cause floods in urban areas. It is also at risk for earthquakes because of its location on eight tectonic faults. In September 1998, Hurricane Georges claimed 230 lives, caused damage or injury to 344,000 persons and battered 13,000 homes. In November 2000, torrential rains caused major damage in the Department of the North.

Vector-borne diseases: *Plasmodium falciparum* malaria is endemic, causing 59 deaths in 1999 (with 90% underregistration and data from only 4 departments) and a total of 973 cases reported to the MSPP. Epidemiological data are insufficient to estimate the magnitude of the dengue problem in Haiti, but in 2000, 59 clinical cases of dengue were reported. The *Aedes aegypti* vector is present throughout the country. Lymphatic filariasis is widespread in urban areas, especially in the Department of the North. In some cities of the

North and of the Center, the rate of microfilaria carriers exceeds 30%.

Diseases preventable by immunization: As a result of the discontinuation of vaccination efforts during 1995-1999, an epidemic of measles occurred in the city of Gonaïves in March 2000 (990 confirmed cases, most of them in the area of Port-au-Prince, during that year). Despite immediate vaccination efforts, cases were confirmed in various municipalities. By the end of 2000, measles vaccination coverage had reached 75% in the country. Unsatisfactory vaccination coverage resulted in a case of acute flaccid paralysis reported in 2000 in a 2-year-old girl. Virologic studies identified a poliovirus derived from the Sabin type 1 vaccine. Seven more cases occurred in 2001, the last one in July. Vaccination coverage after the epidemic was 100%. Eight cases of diphtheria were reported in 1999, and 60 cases of neonatal tetanus in 2000. However, the true number of cases is thought to be greater.

Intestinal infectious diseases: Diarrhea and gastroenteritis are the second leading cause of death in the general population, especially in children. Typhoid accounted for 67 registered deaths in 1999, although it is not subject to surveillance.

Chronic communicable diseases: In 1999, the estimated prevalence of tuberculosis - the sixth most important cause of death in the country - was 114 per 100,000 population. The network of health services observing the WHO DOTS strategy is incipient. The AIDS epidemic has aggravated the tuberculosis situation. It can be said that leprosy is still endemic in Haiti, although its true prevalence is not known.

Acute respiratory infections: According to the 1999 death certificates, there were 209 deaths attributable to acute respiratory infections, 97 of them in children under 5 years of age.

Zoonoses: During 1995-2000 there were 22 reported cases of human rabies and 44 cases of laboratory-confirmed canine rabies, most of them in the Port-au-Prince metropolitan area. Prevention measures such as canine vaccination have been stepped up. Anthrax is endemic in the departments of the North, Southeast, and the Artibonite, but no data is available.

HIV/AIDS and sexually transmitted infections: HIV/AIDS infection affects 4.5% of the Haitian population. It is estimated that every year there are some 13,000 pregnant women who are HIV-positive, and that 30% of their children will be born with the infection. In 2000, a study showed prevalence rates in pregnant women of 5.6% for syphilis and 3.8% for hepatitis B. In 1999-2000, the screening of prospective blood donors showed that 1.4% were positive for HIV, 3.6% for hepatitis B, 0.1% for hepatitis C, and 0.8% for syphilis.

Nutritional and metabolic diseases: According to a survey, overall malnutrition in 1995 was 67.3%. Malnutrition ranks eighth among the causes of general mortality, 76% of cases being in children under 5. Prevalence of anemia is believed to be high. A 1997 study of household and maternal determinants of vitamin A and iron status showed severe stunting in 31% of the sample, and wasting in 4%. Ninety-two percent had vitamin A deficiency. Numerous foci of iodine deficiency have been found and cases of cretinism reported. In 2000, the prevalence of exclusive breast-feeding for 0-5 months was 49% and non-exclusive breast-feeding 99%.

Diseases of the circulatory system: Cerebrovascular diseases are the third leading specific cause of death; other cardiopathies are in fifth place and arterial hypertension in eleventh place. There are more registered deaths among females than males.

Malignant neoplasms: They correspond to 2.5% of registered deaths with a certified diagnosis. In 1999, there were 196 cases of malignant neoplasms (111 in females and 85 in males), the malignant tumors of the digestive tract heading the list (66 cases), followed by those of the male genital organs (33). This information is not conclusive because of sizable underregistration.

Accidents and violence: They contribute significantly to morbidity and mortality in Haiti, especially in the economically active population and among adolescents and youth. In 1999, there were 98 deaths due to transport accidents (12th place among all causes of mortality) and 70 deaths due to assault with a firearm (16th place).

Oral health: Surveys in small localities have found a 37% prevalence of caries in 12-year-olds in the city of Jérémie. It revealed that in 1996, 50% to 79% of the adults had at least one missing tooth and only 1% of the 17-59 years of age had teeth with fillings.

Emerging and re-emerging diseases: In 1999, there were 56 cases of meningococcal meningitis with a case-fatality rate ranging between 20 and 30%.

The response of the health system

NATIONAL HEALTH POLICIES AND PLANS

In 1998, the MSPP published its national health policy, which calls for the strengthening of the Ministry's steering role in the planning, execution and evaluation of health programs, while recognizing the difficulties it had to face with inadequate human and financial resources to serve a nation immersed in poverty and with great health needs. The Municipal Health Units (UCSs) are decentralized administrative units responsible for carrying out a series of health activities with the participation of the community. Although traditional medicine is recognized and widely practiced, it does not receive direct support from the health sector.

HEALTH SECTOR REFORM STRATEGIES AND PROGRAMS

The primary health care strategy serves as the basis for national health programs. Although not yet institutionalized in the health services, it is provided in the form of a minimum package of services that includes health care for children, adolescents and women; emergency medical and surgical care; communicable disease control; public health education; environmental health; water supply; and the supply of essential drugs. The second strategy is the reorganization of the health system, which includes the still incipient functional decentralization of the Ministry based on the UCSs.

THE HEALTH SYSTEM

It includes: a) the public sector (Ministry of Public Health and Population and Ministry of Social Affairs); b) the private for-profit sector (all health professionals in private practice); c) the mixed nonprofit sector (Ministry of Health personnel working in private institutions (NGOs) or religious organizations); d) the private nonprofit sector (NGOs, foundations, associations); and e) the traditional health system. A number of central bureaus execute the health programs (except AIDS

and tuberculosis, directly under the Office of the Director General). There are also 10 directorates (one for each department and for the Nippes Coordination), under which come the UCSs. Due to the country's political problems, there has been no recent progress in health legislation. All health system institutions are coordinated by the Ministry of Health, however it has been unable to assume its leadership role in the recent past, as the economic embargo directed resources toward the nonprofit sector. The health services reach 60% of the population. There are 371 health posts, 217 health centers and 49 hospitals. It is estimated that 40% of the population relies on traditional medicine, mostly in rural areas.

ORGANIZATION OF HEALTH REGULATORY ACTIONS

The inadequate legal framework hampers the formulation of strategies and the execution of activities to guarantee minimum services. The nation's laws governing the safety and efficacy of drugs were enacted in 1948 and 1955. The new law, drafted in 1997, has still not been approved because of political problems.

Environmental quality: As 71% of the energy consumed in the country comes from wood and charcoal, only 3% of the land area is covered by natural forests, causing soil erosion and clogging urban sewers with mud. In dwellings, coal smoke causes many respiratory problems, especially in children. Inadequate management of excreta and household refuse causes contamination of surface waters.

ORGANIZATION OF PUBLIC HEALTH CARE SERVICES

Health Promotion services: Communication activities are integrated into various MSPP programs, which collaborate with the health media. The healthy municipalities initiative got underway at the end of 1998.

Disease prevention and Control Programs: High priority is given to AIDS and tuberculosis control, through networks with NGOs, public and private institutions. A program for feeding schoolchildren and the control of parasitoses was initiated in 2000.

Health analysis, epidemiological surveillance, public health laboratory systems: The health sector has no established health information system that would generate a culture of use and analysis of information. A strategic plan for the development of epidemiology was designed in November 2000, with 6 lines of action to remedy this deficiency.

Potable water and excreta disposal services: Access to water for human consumption is a major problem in Haiti. The Metropolitan Autonomous Station for Potable Water is the State enterprise responsible for the distribution of potable water. In 1999, the potable water supply system reached 47% of the population in the Port-au-Prince area, 46% in secondary cities, and 48% in rural areas. In 1999, coverage with excreta disposal systems was 44% in urban areas and 18% in rural areas. There is no control of hospital waste.

Food safety: The Ministry of Agriculture has a food control laboratory, but only for monitoring purposes. It is impossible to exercise any control over the sale of prepared food sold in the street.

Food aid programs: It is estimated that 159,000 tons of food aid was received by Haiti in 1994 (68% from the US) and programs are carried out mainly by NGOs.

ORGANIZATION OF INDIVIDUAL HEALTH SERVICES

Although mental health is not considered a national priority, there are two government institutions that provide mental health care in the Port-au-Prince area. The Haitian Red Cross has 6 transfusion centers in the department capitals and there are also centers in private institutions, although blood safety cannot be guaranteed in the latter.

HEALTH SUPPLIES

There are three pharmaceutical laboratories that have been officially designated to produce drugs for national use and they cover 30 to 40% of the Haitian market. Drugs are dispensed at numerous sites (some unauthorized). The public sector has an essential drug program with a decentralized logistic system. Eighty percent of the country's expenditure on drugs is made by the private sector. With the problems involved in regulating the sector, it is impossible to know the precise volume of pharmaceutical products available on the market.

HUMAN RESOURCES

In 1998, there were 2.4 physicians per 10,000 population and in 1996 there was 1 nurse per 10,000 and 3.1 auxiliaries per 10,000. There are sizable differences by departments. Human resources are insufficient but lack of funds has prevented the MSPP from creating new positions and many professionals go into private practice or emigrate. In 1999, a bilateral cooperation agreement was signed with Cuba, under which 500 Cuban health professionals have been working in 62% of the municipalities, for 5 years until the return of 120 young Haitians now studying medicine in Cuba. There are public and private schools (of the four private schools of medicine, only one is recognized by the State). In 1998, there were nine recognized nursing schools. In 2000, a school for nurse-midwives opened. Oversight of training of health personnel and of professional practice is ineffective. Since 1998, a dozen public sector hospital administrators and directors are trained every year.

HEALTH RESEARCH AND TECHNOLOGY

The Epidemiology and Research Service under the MSPP is responsible for planning and carrying out research contributing to policies and programs in disease prevention and control. There are financial limitations and lack of trained personnel. Several other institutions conducting research are not approved or overseen by the MSPP.

HEALTH SECTOR EXPENDITURE AND FINANCING

Public funds spent on health represent only 0.8% to 1% of the GDP. Most of the MSPP's allocation (US\$ 57 million in 1999, unchanged since 1996) is spent on salaries. Execution of the investment budget, which depends largely on foreign aid, was 49% in 1999. Activities are thus slowed down or halted and morale is low. To remedy this, operational spending was decentralized in 1998 in all departments except the Department of the West.

EXTERNAL TECHNICAL COOPERATION AND FINANCING

Nine specialized UN agencies have offices in Haiti, six of them working in health. There is also cooperation with the IDB and the European Union and bilaterally with USAID, CIDA and the governments of France, the Netherlands and Japan. When Haiti joined CARICOM, regional integration was strengthened. However, there are still not many collaborative activities with the Dominican Republic except joint meetings and visits by technicians to both countries, as well as a project on prevention and control of rabies.

Honduras

General Situation and trends

Honduras has an area of 112,492 km² and it is divided administratively into 18 departments and 298 municipalities, over 3,000 towns. In 2000, it had an estimated total population of 6,194,926 inhabitants, with a density of 55 inhabitants per km²; the annual growth rate was 2.8%; 44% of the population was urban and 49.6% were women. Forty-three percent were under 15 years old and 6% were 60 years and over. Indigenous groups represented 12% of the total population.

The economy was characterized by a GDP depending on exports of goods and services, with low development of domestic consumption. In 1999, the GDP fell 1.9% from 1998. In 1999, hurricane Mitch had a negative effect on the economy, although the impact was partially diminished by international collaboration.

In 2000, the school coverage was 96% for the primary level, but 52.6% of the elderly population was illiterate.

According to estimates of the Secretariat of Planning, the crude death rate in 1996 was 5.8 deaths per 1,000 population, (32,666 deaths; 18,510 male); 15% of deaths were reported through hospital discharges. According to the General Bureau of Statistics and Censuses, the estimated under-registration of mortality was 47% in 1999.

Specific health problems

BY POPULATION GROUP

Children (0-4 years): According to the National Survey of Epidemiology and Family Health of 1996, the infant mortality rate was estimated at 36 per 1,000 live births (53% neonatal), between 1991 and 1995. Acute respiratory infections and acute diarrhea with dehydration were the leading causes of death in children under 5.

Schoolchildren (5 to 9 years): In 1994, among children 5-9 years of age there were 375 deaths, 2.3% of the total deaths.

Adolescents (10 -14 and 15-19 years): In 1999, 17% of hospital discharges were adolescents: 47.8% due to the female reproductive process and care related to pregnancy, child-birth and puerperium. Violence (mainly injury and poisoning) accounted for 27% of hospitalizations. Survey data in this period indicated that the fertility rate of females 15-19 years of age was 136 births per 1,000 women. The survey also showed that the first sexual experience occurred before 15 years of age among 20% of women. The maternal mortality rate among those 12-14 years of age (391 per 100,000 live births) was almost four times that of the total maternal mortality rate (108).

Adults (20-59 years): Normal delivery and the reproductive process accounted for 43% of hospital discharges in this population group. This age group of women represented 66% of the total female hospitalizations. The use of contraceptive methods among women 20-24 years was 39% and among those 35-39 years it was 58%. The group 15-59 years of age comprised 90% of AIDS cases, of which 61% were males.

The elderly (60 years and older): In 1999, 59% of this population lived in rural areas. Elderly adults generated 10.2% of all public health outpatient consultations.

Figure 1: Population structure, by age and sex, Honduras, 2000

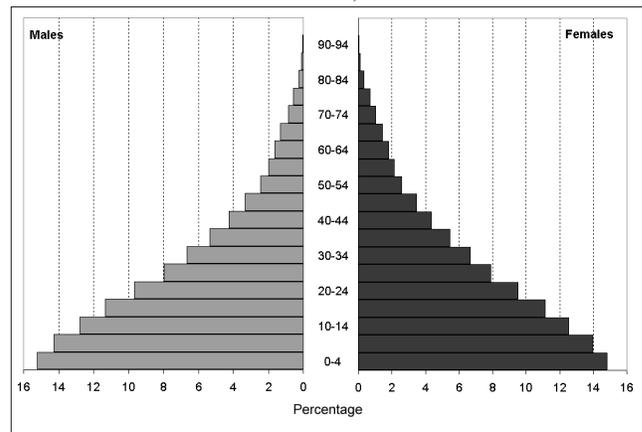


Figure 2: Gross domestic product, annual growth (%), Honduras, 1991-2000



The disabled: It is estimated that more than half a million inhabitants of the country display some degree of physical or mental disability.

Indigenous groups: More than half a million Hondurans are indigenous and/or of Afro descent; they are distributed among 9 culturally distinct groups: Lencas, Chortis, Tolupanes, Tawahkas, Garífunas, Afro English-speaking, Pech, Nahuatl, and Miskitos. Their health status reflects their marginalized situation, including lack of access to basic health services and limited social participation.

BY TYPE OF HEALTH PROBLEM

Natural disasters: In 1998, the country was affected by Hurricane Mitch in 1998 and in 2000, a great drought affected more than 85,000 people of the southern region of the country. Hurricane Mitch brought torrential rains, and floods that affected 11 of 18 departments of the country, resulting in 1.5 million victims; 5,657 dead; 8,058 missing; and 12,272 injured. Losses due to Hurricane Mitch were estimated by the Economic Commission for Latin-America and the Caribbean (ECLAC) at almost 3.8 billion dollars (70% of GDP) and nearly 100% of foreign debt.

Vector-borne diseases: Malaria has been endemic since the 1950s. The Northern coastal area of the country (Department of Colón) recorded the greatest number of cases, reporting 36% of cases in 1999. At the end of 2000 there were 35,122 registered cases of malaria. Dengue has been endemic in Honduras since 1998, when 28,064 cases were reported and 77 cases of dengue hemorrhagic fever were confirmed. In 2000, the country reported an epidemic concentrated in Tegucigalpa, with 13,795 cases. In 1999 dengue hemorrhagic fever caused 8 deaths with a case-fatality rate of 20% and in 2000, 10 deaths with a case-fatality rate of 3%.

Diseases preventable by immunization: No cases of poliomyelitis have been reported since 1989, and vaccination in children under 2 years of age had a coverage over 90% in 1998-2000. The last case of measles was reported in 1996; vaccination coverage of children under two was 98% from 1998-2000. The coverage with DTP vaccine in the population under 2 has been 94% or higher since 1997. The country has not reported cases of diphtheria since 1981. Several whooping cough outbreaks have occurred in recent years, with more than 648 cases and 28 deaths in 1996-2000. In 2000, no case of neonatal tetanus had been reported. The coverage with BCG vaccine has been higher than 97%. In 2000, only 4 cases of tuberculosis meningitis were reported in children under 5. Rubella has been controlled with the pentavalent vaccine (MMR, plus anti Haemophilus Influenzae and anti Hepatitis B) since 2000.

Intestinal infectious diseases: In 1997, 90 cases of cholera were reported. In 1998 there was an outbreak in Mosquitia (Department of Gracias a Dios) with 289 cases and a 3.9% case-fatality rate. In 1999, 57 cases and 3 deaths were reported. In 2000, 15 cases of cholera were reported and 3 died. The annual average number of cases of diarrhea for this period fluctuated around 200,000, 85% in children under 15.

Communicable chronic diseases: There was an average of 4,700 cases of TB reported between 1997 and 1999. The association between TB and HIV/AIDS increased in the period 1996-2000. In 1998, the National Program of Leprosy was reinitiated after being discontinued for almost two years (1996-1998). At the end of 1998, the program had followed up on 78 cases, of which 13% remained on multiple drug therapy. In 1999, cases declined to 72.

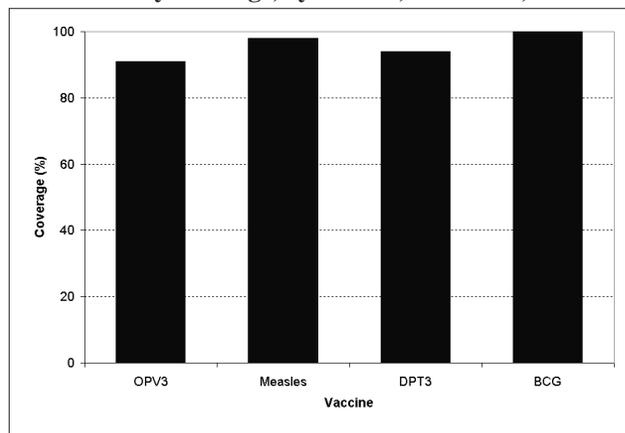
Acute respiratory infections (ARI): The general trend of ARI in the country has been increasing constantly, with an annual average rate of 5%. In 1996, about 90,000 infections were reported; in 1998, reported cases reached 98,790.

Zoonoses: In 1998 and 1999, there were 7 and 5 cases of canine rabies and no case of human rabies reported. In 2000, 1 case of human rabies and 15 cases of canine rabies were reported.

HIV/AIDS: In the Department of Cortés, the metropolitan areas of San Pedro Sula and Francisco Morazán (Tegucigalpa) accounted for 60% of the 11,789 confirmed cases of HIV in 2000. The pattern of predominant transmission was sexual (85% heterosexual, 3% homosexual and 5% bisexual), blood transfusions (1%) and vertical transmission (6.1%). In 2000 the Male-Female ratio was 1.2.

Nutritional and metabolic diseases: In 1996, The Micronutrient Survey found that 26% of non-pregnant women and

Figure 3: Vaccination coverage among the population under 1 year of age, by vaccine, Honduras, 2000



32% of pregnant women were anemic. The prevalence of malnutrition in 1997 was 40.6%, 26% moderate and 14% severe.

Malignant neoplasms: In 1998, 456 cases of malignant neoplasms were reported, of which 67.8% were females. The most frequent sites of primary cancer in women were cervix (34%) and breast (17%). In men the most frequent site was the eye, brain and central nervous system (16%), followed by the hematopoietic and reticuloendothelial system (15%) and genitalia (4%).

Emerging and re-emerging diseases: Between 1998 and 1999, a laboratory diagnostic capability was developed for leptospirosis, and in 1998, the first diagnosis was made 4 days after the occurrence of Hurricane Mitch. In 1999, 39 cases of leptospirosis were diagnosed.

The response of the health system

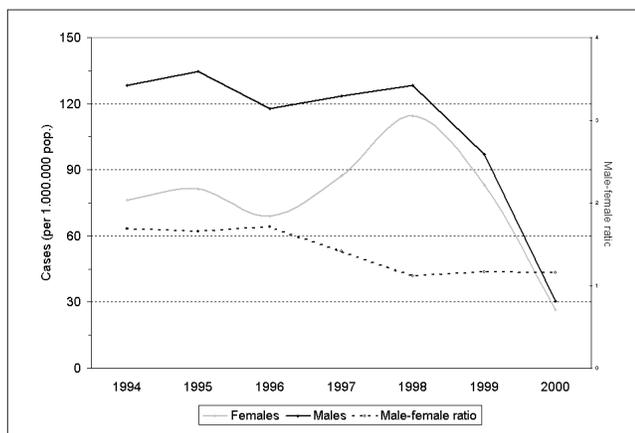
NATIONAL HEALTH POLICIES AND PLANS

The reform process has undergone several stages: modernization of the State (1990), National Initiative Emphasizing Access to health Services (1996), New Agenda in Health (1998) and Transformation of the Health Sector (2000). In 1996-98, the Ministry of Public Health established access to health services as the central policy for reform of health services. In 1998, after the worst disaster in the history of the country, Hurricane Mitch, the Ministry of Public Health issued policy guidelines for 1999-2001 that considered the need to promote health sector reform in the national reconstruction process. The objective was to strengthen the health care network and expand coverage.

HEALTH SECTOR REFORM

The Strategy of Health Sector Reform was based on the principles of universality, solidarity, equity, efficiency, participation, quality, and transparency (guidelines of policy 1999-2001). For the achievement of its objectives, four basic lines of action were designed: institutional development of the Ministry of Public Health; decentralization and local development; health promotion and reorganization of the health care model and strengthening of management. One of the pillars of sectoral reform is strengthening of the steering role of the Ministry of Public Health. To improve the institutional management at different levels, the Coordinating Council of the Ministry and the Technical Council for Institutional Man-

Figure 4: AIDS incidence, by sex, with male-female ratio, Honduras, 1994-2000



agement were integrated. To improve and strengthen the information system, a Management and Financial Information System was introduced in 1999, and a Management Information System was introduced in 2001, both of which were designed to serve as managerial support tools for the information system as a whole.

THE HEALTH SYSTEM

The health system is made up of public and private subsectors; the public sector consists of the Ministry of Public Health and the Honduran Social Security Institute (IHSS), the National Water Supply and Sewerage Service and the National Institute for the Prevention of Alcoholism, Drug Addiction, and Drug Dependence. In the review period, the estimated coverage for the Ministry of Public Health was 60%; Social security covered between 10-12% and the private services covered 10% of the population. The Ministry of Public Health is organized into 9 Health Regions and 42 Areas.

ORGANIZATION OF REGULATORY ACTIONS

The Ministry of Health's Department of Pharmacy is responsible for the regulation of medical drugs and concentrated efforts on the Public Health Registry, with 8,725 drugs, 83.4% proprietary and the rest generic. Water and sewerage services and sanitation in general have shown limited progress in the last five years. Investment over the last two years in this sector has focused on repairing infrastructure damaged by Hurricane Mitch. In 1999, access to potable water at the national level was 80.9%; 71.1% of the population was served with some form of excreta disposal. Since 1995, regular monitoring of air quality has been carried out in Tegucigalpa and intermittently in the cities of San Pedro Sula and La Ceiba. The results of monitoring indicate that concentrations of suspended particulates are continuously outside standard limits.

ORGANIZATION OF PUBLIC HEALTH CARE SERVICES

The Ministry of Education coordinates activities related to sports and for the improvement and promotion of healthy lifestyles. The National Congress has worked on a new code for protection of children as well as various laws to combat alcoholism and drug addiction; a new penal code; a law creating the Children and Family Institute; and a special law on family violence. The Office of the National Commissioner for

the Protection of Human Rights has also been strengthened with special attention given to minor offenders, battered women and abused minors. The Ministry of Public Health's Bureau on Population Risks carried out normative functions for health programs. Up until 2000, epidemiological surveillance was based on a network comprised of 1,190 reporting units that constituted an "Action Alert" system. Technical and financial resources obtained following Hurricane Mitch strengthened the network of public health laboratories.

ORGANIZATION OF INDIVIDUAL HEALTH CARE SERVICES

In 1996, Ministry of Public Health care facilities provided 5.8 million outpatient consultations and 372,000 hospital discharges. There is a National Blood Reference Center, 26 blood banks and 29 blood collection centers. Mental health care was mainly concentrated in hospital services, including 2 psychiatric hospitals.

HEALTH SUPPLIES

Total spending on drugs amounted to 1.9% of the GDP in 1997 and 1.7% in 1998. There are no programs to control the price of drugs. The Ministry of Public Health has a Basic List of Drugs including 271 active ingredients. Public spending on health allocated to drugs was 13.8% in 1996, 14.6% in 1997, 12% in 1998 and 8.3% in 1999.

HUMAN RESOURCES

In 2000, there were 5,287 registered physicians, 37.8% working in the public subsector (8.8 physicians per 10,000 population). There were 1,957 registered professional nurses (3 per 10,000), 45.3% of them working in the public subsector.

HEALTH RESEARCH AND TECHNOLOGY

The Honduran Science and Technology Council is responsible for coordinating the sector's science and technology. In 2000, the Ibero-American Program of Science and Technology for Development was launched to train human resources in areas of scientific and technological research, to help solve specific problems and implement projects of social interest.

HEALTH SECTOR EXPENDITURE AND FINANCING

The sources of health sector financing in 1999 were: families (53.7% of national spending on health); Government (32.9%); IHSS (7.8%); and non profit organizations and private insurers (4.3% and 1.3%, respectively). Between 1993 and 1999, the financing of the Ministry of Public Health increased by 91.6%, mainly due to external financing that reached 117%. The financing of the IHSS, sustained through member contributions, was insufficient to cover expenses. Public spending on health in relation to public spending as a whole decreased from 7.2% to 6.7% between 1993 and 1998. The total per capita health expenditure showed a decline of 24.1% between 1995 and 1999.

EXTERNAL TECHNICAL COOPERATION AND FINANCING

After Hurricane Mitch, the flow of technical and financial cooperation increased considerably. Bilateral international cooperation for all sectors amounted to US\$ 1,113.2 million; increasing non-reimbursable funds to US\$ 945.8 million. Multilateral Cooperation amounted to US\$ 1,099.3 million; the non-reimbursable funds reached US\$ 298.8 million. The total of non-reimbursable funds was US\$ 1,244.6 million and the total of the reimbursable funds was US\$ 967.9 million.

Nicaragua

General situation and trends

Nicaragua has a surface area of 130,244 km². The country is divided into 15 departments and two autonomous regions. The Pacific region, which covers 15.2% of its land area, has 58.2% of the population.

The population was estimated at 5,710,670 inhabitants as of the year 2000 and 56.4% lived in urban areas. The indigenous population comprise approximately 5% of Nicaragua's total population. Most indigenous groups live on the Caribbean coast.

For the period 1995–2000, life expectancy at birth was 68.4 years, the birth rate was 35.3 per 1,000 population, and the fertility rate was 4.4 children per woman, being greater in rural areas. However, the annual rate of population growth slowed 2.7% over the period 1995 to 2000. Emigration and internal migration have a strong impact on the country's economy. According to the National Quality of Life Survey conducted in 1998 by the National Statistics and Census Bureau (INEC), as of 1998, 47.9% of the population was living in poverty and 17.3% was living in conditions of extreme poverty. The survey also showed that the illiteracy rate was 23.4% in 1998.

The three cornerstones of the Government's social development strategy are the furtherance of economic growth, particularly in rural areas; the promotion of spending on social programs for the poor that are designed to reduce their vulnerability to economic, social, and environmental risks; and the building of a stronger social safety net for vulnerable groups in order to break the vicious cycle of intergenerational poverty.

The size of the economically active population (EAP) as of 1998 was estimated at 1,728,900 individuals, 11% of whom were unemployed. Unemployment more heavily affects women (in 1999, 14% of the EAP in urban areas and 30% of the EAP in rural areas). In July 1999 the Ministry of Labor reported that 56% of the urban gainfully employed EAP earned less than US\$ 9.20 per month, while the cost of the basic basket of goods was US\$ 13.30. Only 17% earned more than US\$ 19.40 a month. A mere 12% of female workers had monthly incomes of over US\$ 19.40.

Efforts to downsize the national government are a pivotal part of the structural adjustment process. The assistance furnished by the international community was crucial to reinforce coverage levels for top-priority social services in the wake of Hurricane Mitch. Per capita GDP stood at US\$ 455.80 for the period from 1991 to 1998. It grew at an average rate of 3.2%.

The general mortality rate was 26.5 per 100,000 population in 2000. Infectious diseases fell from fourth to fifth place among the leading causes of death in the last two years, with the number of deaths attributable to this cause down by nearly 50% from 1996. The number of deaths attributable to external causes rose in 1998 in the wake of Hurricane Mitch.

Specific health problems

BY POPULATION GROUP

Children (0–4 years): The infant mortality rate for the period from 1997 to 2000 was 45.2 per 1,000 live births. The leading causes of death among children under one year of age during this period were respiratory and cardiac problems orig-

Figure 1: Population structure, by age and sex, Nicaragua, 2000

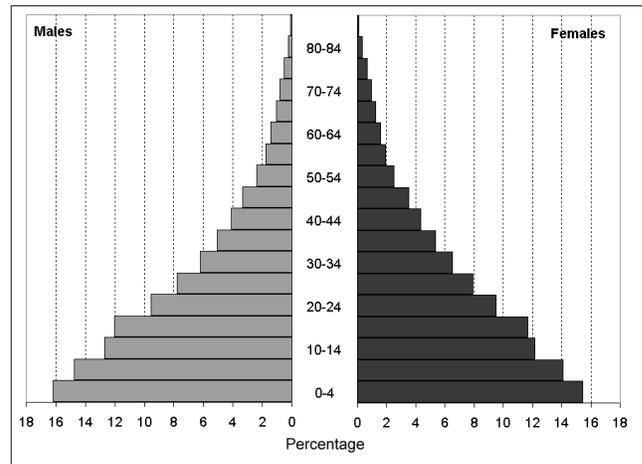
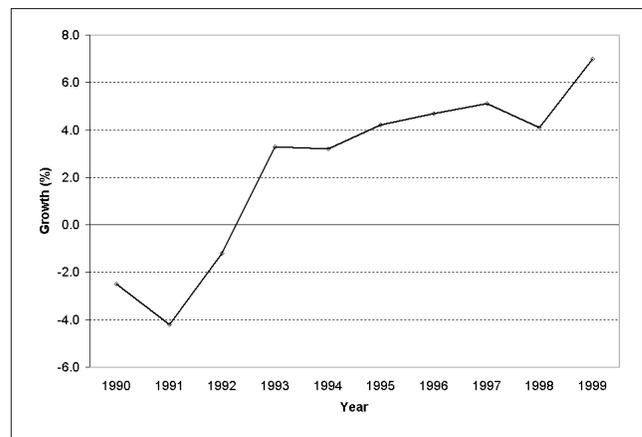


Figure 2: Gross domestic product, annual growth, Nicaragua, 1990-1999



inating in the perinatal period, pneumonia, diarrhea and gastroenteritis, bacterial sepsis of the newborn, and congenital malformations. The leading causes of death among children 1-4 years of age were pneumonia, diarrhea and gastroenteritis, and transport accidents.

Schoolchildren (5–9 years): The leading causes of reported deaths in 1999 and 2000 were transport accidents, pneumonia, accidental drowning and submersion, and accidental exposure to other unknown factors.

Adolescents (10–14 years and 15–19 years): The fertility rate for adolescents in 1999 was 152 births per 1,000 teenage girls of childbearing age (15–19 years of age). Thus, 3 out of every 10 births involved teenage mothers in this age group. The leading reported causes of deaths among adolescents in 1998 were: death associated with natural disasters, pesticide poisoning, and accidents. Youths between 15–19 years of age comprised 30% of cases of acute pesticide poisoning.

Adults (20–59 years): The family planning service coverage level nationwide was 21% in 1999. According to ENDESA-98, the rate of contraceptive use in Nicaragua was compara-

Figure 3: Estimated mortality, by broad groups of causes and sex, Nicaragua, 1995-2000

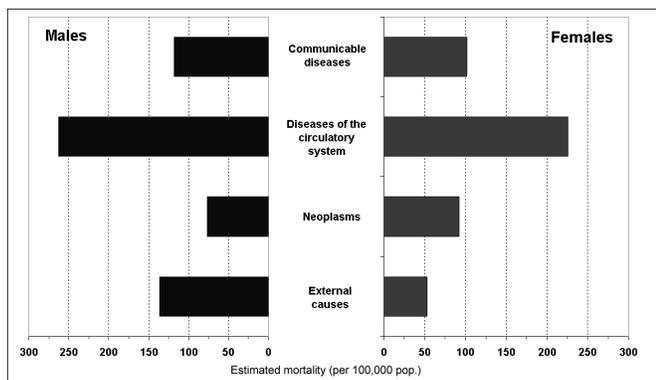
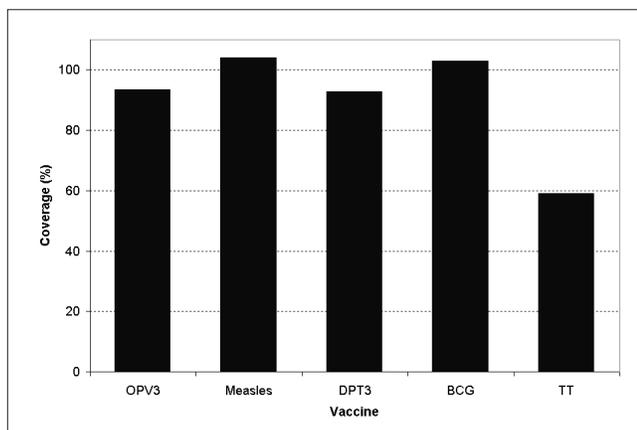


Figure 4: Vaccination coverage among the population under 1 year of age, by vaccine, and tetanus toxoid coverage among women of childbearing age, Nicaragua, 2000



tively high: 68% of all women of childbearing age reported having used some form of birth control at some point in their lives. In terms of maternal mortality, the nationwide Maternal Mortality Surveillance System showed fluctuations, with rates of 102 per 100,000 in 1998, and 133 per 100,000 in 1999. Maternal deaths stemmed from obstetrical problems, with the leading causes being hemorrhages caused by placenta retention, pregnancy-induced hypertension, sepsis, rupture of the uterus, and abortions.

The Elderly (60 years and older): The number of elderly was estimated at 4.7% of the population for the year 2000, with males accounting for 45.4%. The age group 75 and over made up 1% of the total population.

Workers' Health: An estimated 24,000 children 10-14 years of age were working at jobs in the informal sector, with another 6,000 employed in the formal sector. Between 90% and 100% of farmers and farmhands are exposed to some type of pesticide every year. Official statistics for 1999 put the work-related pesticide poisoning rate at 5 cases per 10,000 population. However, studies conducted in various parts of the country estimate annual incidence rates for pesticide poisoning at from 3% to 9% of exposed farm workers.

The Disabled: The National Rehabilitation Program operated by the Ministry of Health estimated the percentage of the

population with some type of disability at 12.1% in 2000. The most common types of reported disabilities were visual impairments (63.9%) and hearing impairments (9.2%). The leading causes of disabilities were problems at birth (10%), disease (29%), war (3%), and accidents (12%).

BY TYPE OF HEALTH PROBLEM

Natural disasters: The worst disaster during this period was Hurricane Mitch, which struck the country in October of 1998. It caused 2,823 fatalities, with another 885 persons reported missing, and damaged 49 municipalities. The most recent disaster was the earthquake that struck the city of Masaya in July of 2000, with a death toll of nine.

Vector-borne diseases: The largest number of malaria cases (76,269) was reported in 1996, with an annual parasite index of 18.4 per 1,000 population. There was a downward trend in malaria cases over the 1997–2000 period. The number of cases of *P. falciparum* malaria nationwide fell 67.2% over the period. The risk of contracting dengue quadrupled in 1998, with an incidence rate of 28.1 per 100,000 population. Circulation of cases of dengue fever serotypes 3 and 2 were confirmed and 432 confirmed cases of dengue hemorrhagic fever were observed. A nationwide entomological survey was conducted from 1998–1999 to establish the prevalence of triatomine infestations in 14 departments (125 municipalities, 31,466 dwelling units), finding prevalence rates of 1%–10%. A seroprevalence study of 11,375 blood samples collected from schoolchildren between 7 and 14 years of age found 387 cases of Chagas' disease (3.4%).

Diseases preventable by immunization: Nicaragua has successfully controlled the spread of diseases preventable through immunization by achieving and maintaining high vaccination coverage levels over the past few years and introducing new vaccines (the MMR vaccine in 1998 and the pentavalent vaccine in 1999). Vaccination coverage for different biologicals ranged from 90% to 100% in 1999 and 2000. There were a total of 132 clinically diagnosed cases of pertussis over the 1997–2000 period. The last registered case of neonatal tetanus dates back to 1997. Vaccination coverage for women of childbearing age is over 95% in most municipalities around the country. There were 37 cases of non-neonatal tetanus reported over the period from 1997 to 2000, the majority of which involved persons over 15 years of age whose occupations put them at a higher risk of exposure. *Haemophilus influenzae* type b vaccination coverage among children under 1 year of age was already greater than 90%. *H. influenzae* type b comprised 56% of all cases of bacterial meningitis, which meant that nearly 200 cases a year could have been prevented through immunization.

Intestinal infectious diseases: After Hurricane Mitch, there were outbreaks of cholera, with 1,451 reported cases (28.2 per 100,000 population) and 36 deaths (0.7 per 100,000 population), for a fatality rate of 2.4%. Only 12 cases and 1 death were reported in 2000. Acute diarrheal diseases are one of the main types of notifiable diseases. Children under 5 years of age are hit hardest by these diseases, accounting for 73% of the total reported. The morbidity rate was 484 cases per 100,000 population in 1997 and 415 in 1998, with mortality rates around 7 per 100,000 in the same years.

Chronic communicable diseases: Tuberculosis is endemic in the country, the incidence rates fluctuated between 13 and 111 per 100,000 population. In 2000, there were 2,396 cases, 1,467 positive by microscopic examination. The population 15–24 years were hardest-hit, accounting for 26% of all cases of tuberculosis.

Acute respiratory infections: Acute respiratory infections were the most common notifiable disease with an incidence rate for the 1997–2000 period of 2,658 per 10,000 population. Children under 5 years of age were the hardest-hit, accounting for 57% of all treated cases of the disease. The mortality rate was 6.47 per 100,000 population, with the hardest-hit group that of children under 1 year of age, which accounted for 55% of all fatalities.

Zoonoses: Two cases of human rabies were reported in the 1997–1999 period, both caused by wounds inflicted by wild animals. Vaccination coverage for canine rabies improved to over 85% countrywide. A leptospirosis epidemic was reported in 1998 in the wake of the flooding caused by Hurricane Mitch, with 705 suspected cases reported.

HIV/AIDS: The total cumulative number of cases of infection by HIV/AIDS over the period from 1987 to the year 2000 was 643 with 294 AIDS patients, of whom 164 have died. The hardest-hit was the 20–44 age group, 81% of all cases, while 74% of all cases were males. The leading mode of transmission was by sexual contact, (88% of all cases, 64% by heterosexual contact), with 9% attributable to intravenous drug use, 2% to mother-to-child transmission, and 1% to blood transfusions.

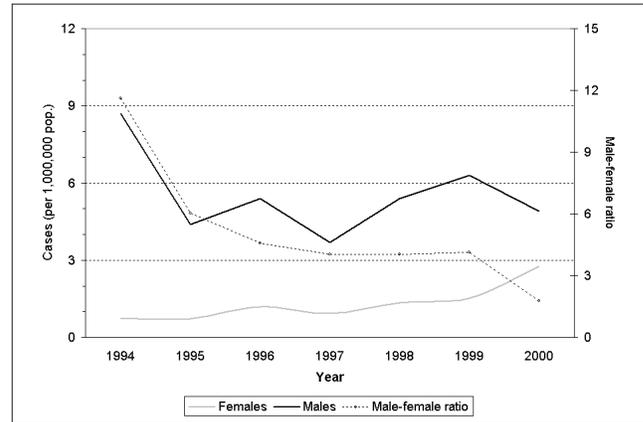
Nutritional and metabolic diseases: ENDESA-98 found one out of every three children malnourished and 9% of all children severely malnourished. The percentage of children in rural areas suffering from some degree of malnutrition was 32%, compared with 19% in urban areas. The mortality rate for all forms of malnutrition was 11 per 100,000 in 1998. Though iodine deficiency is not a public health problem in Nicaragua, thanks to the fortification of salt with iodine, there are high-risk groups in the South Pacific region where the prevalence of goiter in certain communities is over 20%. The nationwide prevalence rate for anemia in children between the ages of 12 and 59 months was 28.4% with an average hemoglobin level of 10.6 mg/dL.

Diseases of the circulatory system: Cerebrovascular disease accounted for 31.7% of deaths due to diseases of the circulatory system in 1992–1993. Hypertension was responsible for 12.6% of deaths attributable to this group in 1998.

Accidents and violence: The leading causes of death in the year 2000 were transport accidents (9.5 per 100,000 population), suicides (7.3), and homicides (6.6). According to ENDESA-98, 29% of the married or in-union women surveyed had suffered sexual or physical abuse at some time. There were 2,473 reported cases of attempted suicide by pesticide poisoning over the period between 1997 and 2000, with a case fatality rate of 25.5%. Women accounted for 44% of these cases.

Oral health: In 1997, of the 233 communities covered by a study on fluoride content of drinking water, only 12% had water supplies with optimal fluoride levels (0.5–1.0 mg/kg). The total prevalence rate for dental caries in children between 6 and 15 years of age was 85% with diagnosis of mild fluorosis in 2.6%, while only 0.8% of the children studied had moderate to severe fluorosis.

Figure 5: AIDS incidence, by sex, with male-female ratio, Nicaragua, 1994-2000



The Response of the health system

NATIONAL HEALTH POLICIES AND PLANS

The National Health Policy 1997–2002 is an extension of the commitment of social policy to alleviate poverty and to improve service coverage, particularly for the poorest and most vulnerable segments of society. There are five separate health policies, aimed at modernizing the health sector, strengthening the Ministry of Health, improving hospital care, formulating new public health strategies, and modernizing the social security system. A number of initiatives designed to strengthen the steering functions of the Health Ministry were initiated based on technical instruments such as the health system profile, health analysis, and the Ministry of Health's investment plan for 2000–2002.

THE HEALTH SYSTEM

Institutional organization: The health sector encompasses both the public and private sectors. The public health sector consists of the Ministry of Health; the Nicaraguan Social Security Institute; and the health services operated by the Ministry of Government and by the Ministry of Defense. The divisions of the Comprehensive Local Health System (SILAIS) represent the Ministry of Health in technical and administrative matters at the departmental level. The private sector includes hospitals, clinics run by health insurance management companies, and nongovernmental organizations.

Developments in health legislation: The National Health Policy 1997–2002 calls for revising and updating of the existing legal framework through the passage of a number of laws and regulations, including the General Health Act, the Unified Health System Act, the Social Security Act, the Drug and Pharmacy Act, food monitoring regulations, regulations for the control of pesticides and toxic and hazardous substances, regulations governing ionizing radiation, regulations for professional health practice, and regulations under the Health Administrators Law.

ORGANIZATION OF REGULATORY ACTIONS

At the primary care level, in 1997–2000, coverage was provided by the different health delivery networks: public networks, 60%; INSS networks, 10%; private networks, 20%; and other networks, 10%. The private sector provides curative care to the insured population (15% of the EAP). The Ministry of Health is the leading health service provider at

both the primary and the secondary care levels. At the primary care level, it operates health centers (some with beds and some not) and health posts. Secondary care level offers general and specialized medical care and outpatient and inpatient care in basic areas. The private health sector consists of eight hospitals, private medical and dental practices and clinics providing outpatient care, clinical laboratories, and diagnostic imaging centers. Insurance management companies provide insurance plan members with prescribed curative services outsourced by the INSS. Insurance management companies have begun offering prepaid plans to expand their service offerings.

The Regulations Office also investigates and responds to complaints with respect to the handling or treatment of patients in public health care facilities and conducts audits to control the quality of health care. The Office of Environmental Health monitors water quality through sampling procedures conducted at specific points of the water supply network. The Ministry of Environment and Natural Resources is also involved in regulatory activities, exercising its powers under Law 290. However, the regulatory framework for environmental protection is lacking, and the country has no systems in place for the assessment of environmental risks. The Ministry of Environment and Natural Resources and the Ministry of Agriculture and Forestry is putting into place programs designed to protect natural ecosystems, with the emphasis on soil and water conservation. The quality of food products is controlled through health inspection and monitoring procedures and surveillance for foodborne disease. The Ministry of Labor is in charge of formulating and coordinating occupational safety and health regulations with relevant agencies and overseeing their enforcement in the workplace.

Evaluation of health technology: The equipment is insufficient and its use is limited by lack of resources for operation and maintenance. In 2000, of all available equipment, 73% was used for diagnostic and treatment purposes and in direct support of medical care; 82% was in hospitals but only 73% was in proper working order. The health centers and health posts had 18% of equipment.

ORGANIZATION OF PUBLIC HEALTH CARE SERVICES

Health analysis, epidemiological surveillance, and public health laboratory systems: The national register is maintained by the National Vital Statistics System (SINEVI), which records official morbidity (mainly hospital-data) and mortality statistics with a one-year delay. The national and local epidemiological surveillance systems covers 25 specific health problems subject to immediate notification requirements, such as outbreaks of disease and disasters. Both SINEVI and the epidemiological surveillance system data are used for strategic planning and health service management purposes at the local and national levels.

Potable water and sewerage services: Potable water supply was 89.4% in 1998, the urban coverage was 89.5% and the rural coverage 33.7%. Of the samples collected in 1999, 4% contained over 50 fecal coliform bacteria per 100 mL. The percentage of the population without access to adequate excreta disposal service dropped to 21.1% in 1998. Only 4.7% of the urban population was still without service, compared with 31.7% of the rural population. Only 34% of collected wastewater received any type of treatment. The urban population generated an estimated 1,396 metric tons of solid waste

in 1999, 65% of which were not subject to proper disposal methods. A great deal of progress has been made in the area of environmental protection legislation, with the passage of the General Environment and Natural Resources Act, environmental impact assessment regulations, the Law Governing Pesticides and Toxic and Other Hazardous Substances, regulations governing effluents, and the act creating the Environmental Protection Agency.

ORGANIZATION OF INDIVIDUAL HEALTH CARE SERVICES

The primary health care network offers virtually all types of health promotion and risk and disease prevention services as well as general curative care and preventive and restorative dental care. The physical infrastructure administered by the Ministry of Health consists of 996 health care facilities, 48.3% of which are concentrated in the Pacific coast area. Managua has 11 hospitals, more than a third of all hospital facilities. The INSS has no health delivery infrastructure of its own, outsourcing health care services to public and private service providers.

HEALTH SUPPLIES

Efforts to develop a pharmaceutical industry are based on the country's National Medicinal Drug Policy, whose strategies for the 1997–2001 period focus on institution-building, promoting access to essential drugs, quality assurance, and rational drug use. The essential drugs list for 2001 consists of 345 active ingredients, with their generic names, and 509 drugs in their various pharmaceutical forms. The list is used as a yardstick for the procurement, distribution, and use of drugs in the public sector and the for-profit and not-for-profit private sector. According to the Drug Regulations Office attached to the Ministry of Health, as of the year 2000, there were 12,000 registered products, 255 drug importers/distributors, 12 domestically owned pharmaceutical laboratories whose output covered an estimated 20% of nationwide needs.

HUMAN RESOURCES

In 1999, there were 23,285 health care workers, 32% of the government workforce, of whom 47.4% were assigned to the primary care level and 52.6% to the secondary care level. The wages of health care personnel consumed 60% of the Health Ministry budget. In 2000 there were 5,656 registered general practitioners, 950 specialists, 323 professional nurses, 974 dentists, 1,042 pharmacists, 56 mid-level laboratory technicians, and 21 radiologists. The number of nursing personnel in 1999 totaled 1,538, of whom 62% were assigned to the secondary care level, and 23% concentrated in Managua. Of the auxiliary personnel, 52% worked at the primary care level. In order to practice, health professionals must register their university degrees with the Regulations and Accreditation Office attached to the Ministry of Health. An estimated 90% of the nation's physicians are registered.

HEALTH SECTOR EXPENDITURE AND FINANCING

Health resources are drawn from the public sector (41.5%), the private sector (44.8%), and external cooperation (13.7%). Per capita health spending in 1998 reached US\$ 45.1. The government allocation to the Ministry of Health for 1998 as a percentage of GDP was 3.2% in real terms, or the equivalent of 9.5% of the general budget. International assistance to the Ministry of Health over the period from 1991 to 1998 as a percentage of GDP was approximately 1.3%, or the equivalent of 25.6% of its total budget. Household spending on health as a percentage of GDP ranged from 2.5% to 2.8%.

Absence of Transmission of the D9 Measles Virus in the Region of the Americas, November 2002 - May 2003

In line with the goal set in 1994 by countries of the Americas to interrupt indigenous measles transmission, as of 14 May 2003, the Region has been free for 24 weeks from known indigenous circulation of the D9 measles virus, the strain responsible for the only large outbreak of measles in the region during 2002.

The measles vaccination strategy recommended by the Pan American Health Organization (PAHO) includes a one-time, national "catch-up" campaign for all children 1 to 14 years of age, routine "keep-up" vaccination for infants aged 1 year, and national "follow-up" campaigns every 3 to 4 years for all children 1 to 4 years of age, regardless of measles vaccination history. Rapid house-to-house monitoring for local validation of vaccination activities and active epidemiologic and virologic surveillance are also important parts of the strategy.

During 1997-2001, reported confirmed measles cases in the Region of the Americas decreased 99%, from 53,683 in 1997 to 541 in 2001. Although the transmission of the D6 measles virus genotype was interrupted in September 2001, that same month the D9 genotype was introduced into Venezuela by a traveler returning from Europe. The resulting

outbreak included 2,501 cases in Venezuela and 140 cases in Colombia; however vaccination efforts by both countries stopped further transmission of the virus. As of 14 May 2003, no circulation of the D9 virus has been reported for 24 weeks.

Progress toward interruption of indigenous measles transmission in the Region of the Americas reflects sustained high political commitment by member countries and full implementation of PAHO's recommended measles-control strategies and suggests that global measles eradication is achievable. However, important challenges remain. Measles is still endemic in other regions, and sporadic cases continue to occur in the Region of the Americas because of importation. The majority of countries in the region have not achieved and sustained routine measles vaccination coverage rates of $\geq 95\%$ in all municipalities. Because poor, underserved neighborhoods in large cities that attract migrants of rural origin are particularly at risk for measles outbreaks when the virus is reintroduced, persons living in these areas are targeted for supplementary vaccination activities.

Source: PAHO's Area of Family and Community Health, Immunization Unit, as published in: Public Health Dispatch: Absence of Transmission of the D9 Measles Virus — Region of the Americas, November 2002—March 2003. *MMWR* 2003;52(11):228-229

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Erratum: We are including in this issue of the *Epidemiological Bulletin* a page to replace page 7 of Vol. 23, No. 4 (December 2002). Page 7 of that issue is incomplete due to a printing problem. We apologize for the inconvenience.

The formulas should appear as follows:

$$Z = \frac{(X_i - \bar{X})}{S} \quad \text{and} \quad HCI = Z_1 + Z_2 + Z_3 + \dots + Z_n$$

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