

# GUYANA



**Sources:** Second Administrative Level Boundaries Dataset (SALB), a dataset that forms part of the United Nations Geographic Database, available at: [http://www.who.int/whosis/database/gis/salb/salb\\_home.htm](http://www.who.int/whosis/database/gis/salb/salb_home.htm), and the Digital Chart of the World (DCW) located at: <http://www.maproom.psu.edu/dcw>. The boundaries and names shown here are intended for illustration purposes only, and do not imply official endorsement or acceptance by the Pan American Health Organization.

**G**uyana is located on the northeastern coast of South America, where it is bordered by Venezuela to the west, Brazil to the south, and Suriname to the east. It is the only English-speaking country in South America. The country covers an area of approximately 215,000 km<sup>2</sup> and has an estimated population (mid-year 2006) of 767,000, the majority of whom live along the coastline.

## GENERAL CONTEXT AND HEALTH DETERMINANTS

### Social, Political, and Economic Determinants

A former British territory, Guyana gained independence in 1966 and became a republic in 1970. The country is a democratic republic functioning under a Westminster system of government. The legislative branch is represented by a unicameral National Assembly comprised of 12 nonelected members and 53 members elected under a system of proportional representation. An Executive President is both the Head of State and Government. The country is divided into 10 administrative regions. The local government structure consists of 10 Regional Democratic Councils (RDC), 65 Neighborhood Democratic Councils (NDC), 6 municipalities, and 76 Amerindian Village Councils. Both regional and local governments play an important role in the provision of public services in Guyana. The RDCs are administratively responsible for the delivery of services such as health and education to their respective populations. Because of its historical and cultural development, Guyana is linked to the English-speaking Caribbean and is a Caribbean Community and Common Market (CARICOM) member, as well as part of the British Commonwealth of Nations.

The economy is based on natural resources. Agriculture, forestry, and fishing accounted for 30.3% of gross domestic product in 2005, with sugar being the main contributor; mining and quarrying accounted for 10.5%, followed by manufacturing (8.0%) and engineering and construction (6.2%). The remaining 45% of the GDP was accounted for by services. During the last five years, Guyana has experienced a number of external and internal shocks that significantly weakened the economy. These setbacks included a continuing decline in export prices for bauxite, gold, timber, and rice, as well as a depreciation in the dollar that resulted in reduced values of preferential sugar exports, a public services strike, and rising oil prices. Agricultural production was severely impacted by heavy rains and flooding during the first quarter of 2005. The economy has potential for diversification, and the country depends on the production and export of raw materials, which have very little added value.

The Government seeks to restore confidence in the domestic economy by generating sustained growth, creating new employment opportunities, and protecting the environment. It currently is pursuing a privatization program aimed at improving the efficiency of enterprises, reducing public sector financial and administrative burden, redeploying scarce public resources, and increasing modernization through better management, technology, and new investments.

The country has a high debt burden. In 2001, debt stood at G\$ 32 billion, or 23.4% of GDP. Having qualified for debt relief under the Highly Indebted Poor Countries (HIPC) Initiative, G\$ 3.3 billion was erased by the International Monetary Fund in December 2005 and has been reallocated to health, education, and poverty alleviation programs. Political priorities on the health agenda include providing adequate funding for primary health care programs and basic drugs, low income housing, and water and sanitation infrastructure.

The 10 administrative regions have varying topographical features, population distributions, and levels of development, which in turn influence health status. According to the Economic Commission for Latin America and the Caribbean, almost 90% of Guyana's population lives along a narrow strip of the coastline, which is the administrative, agricultural, commercial, and industrial hub of the country.

The capital city of Georgetown, with 156,000 people, comprises 20.7% of the total population. The interior is sparsely populated with limited health infrastructure. Regions 7 (Cuyuni-Mazaruni) and 8 (Potaro-Siparuni), where much of the mining and quarry sector is located, share the same population density but have populations of 14,682 and 6,000, respectively. Household size declined from 4.7 persons per household in 1991 to 4.1 persons in 2002, indicating a large increase in standing houses. Also, while the household population has grown only 3.3%, the number of households has grown by 20.5%. The largest increase in housing has been in the coastal region that includes Georgetown.

The risk groups most affected by poverty are Amerindians, who are mostly located in the country's undeveloped interior; those of mixed race (a combination of Amerindian, African, Indian, and/or

European ancestry); and women. Amerindians recorded the highest level of poverty among ethnic groups, while the prevalence of poverty is higher among women than men. In particular, women are paid lower wages and salaries, face major difficulties in accessing credit, experience more serious health problems than do men, and have higher rates of illiteracy.

Poverty reduction is a government priority. The 2002 Poverty Reduction Strategy Paper (PRSP) examined how determinants of health outcomes affect the poor and proposed policies to address them. It also evaluated investments and policies for improving the health of the poor. Health and nutrition are key components within the PRSP. The role of health in development is emphasized in both the PRSP and the National Development Strategy.

The size of the working-age population has continued to grow steadily and accounted for two-thirds of the population in 2002. Almost one-third of this population is involved in duties in and around the home, while 7% attend school. Although males comprise a little more than one-half of the total population, they account for 49.7% of the working-age population. Of working-age males, approximately 7% are attending school, 5% perform home duties, and 2% form part of the institutional population. By contrast, for females of working age, a little over one-half perform home duties, and 7% attend school. The female institutional population is also very small (0.6%) compared to males. Twenty-two percent of the male working-age population is not engaged in any type of activity to earn formal income, compared with 66% of females.

Education is a legal requirement for children from 5 years and 9 months of age to age 14. Approximately 60% of the school-age population (i.e., up to age 18) currently attends school, up from 55% at the previous (1991) census. The highest percentages of school-age children who actually attend school are in the 5–9- and 10–14-year-old age groups. Just over 90% of children in these age groups attend school, which indicates that the Millennium Development Goal (MDG) target for primary school enrollment has been surpassed.

Housing has become increasingly modernized. According to the 2002 census, the percentage of households without toilet facilities stood at 2%, compared to the 3.1% recorded in the 1991 census. Despite the increased use of toilet facilities, these are usually linked to cesspits or septic tanks, given the higher costs associated with the installation and maintenance of sewer systems. Two-thirds of all households, however, continue to use pit latrines, considered by MDG indicators to be an improved sanitation facility. Nearly 80% of all households have access to a source of improved drinking water as defined by the MDG target (i.e., household connection, public standpipe, borehole, protected dug well, protected spring, or rainwater collection). These improvements corroborate estimates by the World Health Organization/United Nations Children's Fund (WHO/UNICEF) Joint Monitoring Program, which estimated that by 2002, 83% of the Guyanese population would have access to improved drinking

water and 70% to improved sanitation. Significant inequities exist, however, as regards urban versus rural access to adequate water and sanitation facilities. For every urban dweller without water coverage, there are 1.7 rural dwellers. In the case of sanitation, for every one urban dweller without sanitation means, there are 4.9 rural dwellers. The quality of water supply and sanitation in Guyana is poor. Major problems with services safety, continuity, and reliability persist both along the coastal area and in the severely underserved hinterland regions. In many distribution systems, water disinfection procedures do not achieve the minimum amount of free chlorine at point of use as recommended by WHO guidelines, resulting in the risk of microbiological contamination. In 2004, water service availability averaged only about 4.3 hours per day. Additionally, the lack of periodic inspection of household connections has allowed inadequate pipe systems to cross-trench with polluted water.

The Government's strategy for the water and sanitation sector is to improve the services level, increase efficiency, and achieve financial sustainability. In 2002, the Guyana Water Authority and the Georgetown Sewerage and Water Commissioners were merged into Guyana Water Incorporated (GWI). In January 2003, a five-year performance-based management contract for GWI was initiated. Since then, GWI's performance has been below target level, although some progress has been achieved in the performance targets for non-revenue water and collection efficiency, customer relations, and commercial services. Numerous challenges to meeting the proposed standards remain due to inherent difficulties in the present system. These include inadequate maintenance procedures and stresses on the system due to over-consumption and wasting. Additionally, the presence of large amounts of iron in the water hampers the chlorination process, clogs pipes, increases the potential for contamination, and raises the pressure needed for water delivery.

Guyana has experienced a prolonged period of violence in which political conflict, race and ethnic tensions, and the narcotics industry all interact. Civilian violence has included that of civilian against civilian, civilian groups against the country's security forces, and security force violence against civilians. The number of murders up to the end of March 2003 (58) was more than triple the figure for the same period in 2002 (17). This upsurge in violence has had economic, political, and social effects that are national in scope.

Guyana's worst natural disaster occurred in January 2005, marked by torrential rains that led to extensive flooding in the capital city and surrounding areas. Fifty-two inches fell—more than seven times the average coastal rainfall (7.3 inches) for January over the past 100 years—affecting almost 85% of the population, and 37% severely. From one to seven weeks, residents along the coast lived in three to five feet of water, in deteriorating environmental conditions that included the accumulation of solid waste and sewage from pit latrines and septic tanks, carcasses of livestock and household pets, and a contaminated

drinking water distribution system, all factors which heightened the risk of transmission of water- and vector-borne diseases. The disruption to human life and social development resulted in a GDP loss of 59.5%.

In recent years, the number of safety and quality inspections of fish, poultry, and red meat products for human consumption has increased. In 2005, 582 fishing vessels and large poultry processing establishments were audited and inspected for sanitary conditions and certified. Sixteen fishery establishments were audited, inspected, and monitored, along with a number of small dry shrimp and fish processing facilities and small and medium poultry plants. The Ministry of Health's Food and Drug Department Laboratory conducted microbiological testing on 195 fish and water samples. Daily inspections of poultry meats took place during slaughter days at two large poultry processing plants. Fish and meat products exported and imported through the national airport and other port facilities were monitored and inspected, and foods served to airline passengers were subject to safety inspections.

### Demographics, Mortality, and Morbidity

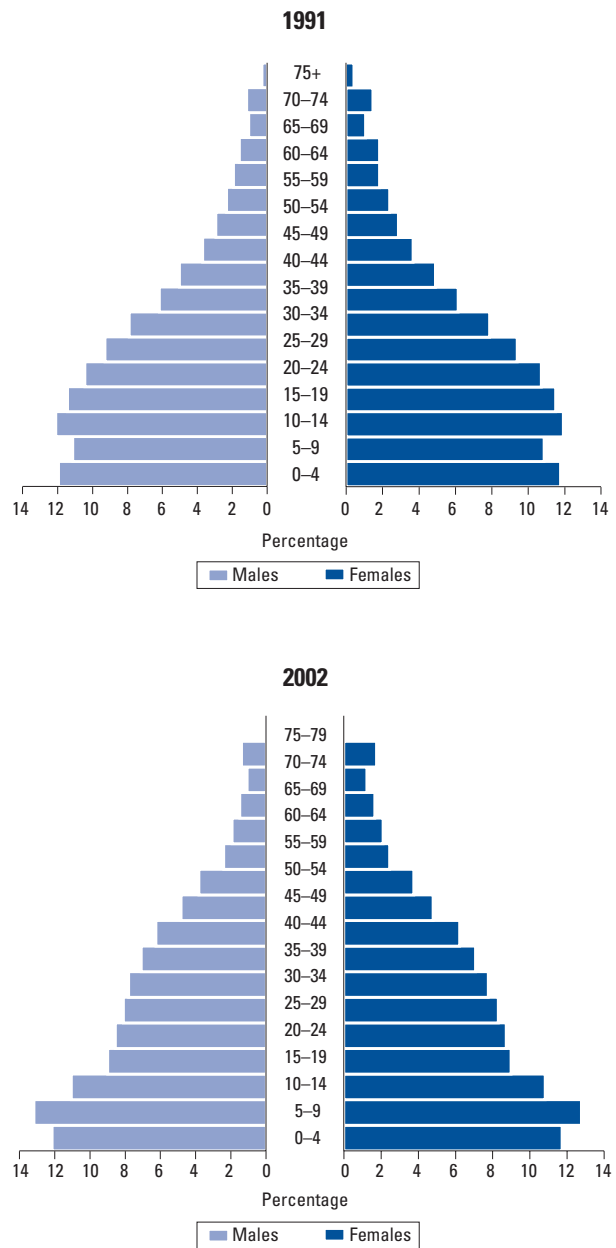
The 2002 census recorded a population of 751,223, compared to the 1991 census of 723,673. There has been a consistently slow growth rate over the last 15 years. Four of the 10 administrative regions have urban centers; the combined population of these towns and the capital city of Georgetown totaled 213,705 (28.4%) of the population in 2002. The remaining 71.6% of the population is clustered in villages, mostly along the coastal belt, as well as a few other settlements scattered deep in the country's hinterland. The non-Guyanese-born population increased from 0.5% in 1991 to 1.3% in 2002. The majority are from Suriname (27%), Brazil (13%), Venezuela (12%), three countries of the eastern Caribbean—Barbados, Saint Lucia, and Trinidad and Tobago (10.7%)—the United States (7.4%), China (6.8%), the United Kingdom (3.4%), and Canada (2.4%).

Comparisons of 1980 age distribution data with that of the latest census show that the population is beginning to age. Fertility rates based on available data substantiate this, showing total fertility rates approaching the replacement level. The overall male-female ratio is nearly 1:1. The population distribution of Guyana in 1991 and 2002, by age and sex, is presented in Figure 1.

Guyana has a multiracial population. The 2002 census indicated that Indo-Guyanese represent 43% of the population, Afro-Guyanese account for 30%, and Amerindians account for 9%. There has been a growth in the population of persons of "mixed" heritage (a combination of Indian, African, Amerindian, European, and/or Chinese ancestry), comprising 17% of the population. The remaining population, less than 1%, include those of European and Chinese descent.

The population composition by religious affiliation is led by Hindus (28.4%); others are Pentecostals (16.9%) and other

**FIGURE 1. Population structure, by age and sex, Guyana, 1991 and 2002.**



Christians (17.9%), Roman Catholics (8.1%), Muslims (7.2%), Anglicans (6.9%), Seventh-Day Adventists (5.0%), Methodists (1.7%), Jehovah's Witnesses (1.1%), Rastafarians (0.5%), Bahai (0.1%), no religious affiliation (4.3%), and other (1.3%).

The 2005 total fertility rate stood at 2.5, down from 3.1 in 1999. In 2004, approximately 20% of all births were to women under 20 years of age, with 3% to girls under 16. The Multiple Indicator Cluster Survey (MICS), conducted in 2000 by the

Guyanese Bureau of Statistics with funding from UNICEF, showed that birth registration of the under-5 population stood at 96.5%. The proportions of children registered show some variation by age of children and mother's education. Children in the country's interior had lower proportions of registration (86%) compared with the urban coast (99%) and rural coast (98%).

The lack of a sustained growth rate in the Guyanese population reflects the continuing impact of external migration to other CARICOM member countries, the United States, Canada, and the United Kingdom. Data on emigration is difficult to accurately measure, due to violations of visa conditions and undocumented travel across Guyana's overland borders. Thus, actual emigration rates are believed to be higher than those officially reported. There also has been an increase in internal migration from urban to hinterland areas, due primarily to an increase in job-generating activity in the mining and quarrying sector.

Over the 2001–2003 period, there was a total of 14,687 registered deaths (57% of them male and 43% female). Among those with defined causes (98.9%), cerebrovascular diseases ranked first (10.9%), followed by ischemic heart diseases (10.3%), HIV/AIDS (8.8%), diabetes (7.5%), hypertensive diseases (4.2%), suicide (4.0%), conditions originating in the perinatal period (3.8%), heart failure and complications (3.8%), and cirrhosis or other disorders of the liver (2.9%).

The leading causes of death among children under age 5 were conditions originating in the perinatal period (47.3%), intestinal infectious diseases (11.6%), congenital malformations (10.0%), influenza and pneumonia (6.3%), HIV/AIDS (4.6%), malnutrition and nutritional anemias (3.2%), septicemia (2.1%), events of undetermined intent (1.4%), fluid/electrolyte disorders (1.0%), and land transport accidents (1.0%).

Among children 5–9 years old, land transport accidents accounted for 18.9% of deaths, followed by HIV/AIDS (17.0%), congenital malformations (8.5%), events of undetermined intent (7.5%), and accidental drowning (4.7%).

Suicide was the leading cause of death in the 10–19-year-old age group (17.8%). This was followed by land transport accidents (14.0%), assault (homicide) (7.8%), HIV/AIDS (6.2%), events of undetermined intent (6.2%), congenital malformations (5.0%), vector-borne diseases and rabies (3.7%), influenza and pneumonia (2.8%), accidental drowning (2.5%), malignant neoplasms of lymphoid tissue (2.2%), and status epilepticus seizure (2.2%).

HIV/AIDS (17.7%) was the leading cause of death among adults aged 20–59 years, followed by ischemic heart diseases (7.5%), suicide (7.4%), cerebrovascular diseases (6.6%), diabetes (6.5%), assault (homicide) (5.5%), cirrhosis or other disorders of the liver (4.8%), land transport accidents (4.0%), influenza and pneumonia (2.5%), and events of undetermined intent (2.5%).

Adults 60 years old and older carry the greatest burden of chronic diseases. The leading causes of death in this age group

were cerebrovascular diseases (17.8%), ischemic heart diseases (15.5%), diabetes (10.3%), hypertensive diseases (7.1%), heart failure and complications (6.4%), influenza and pneumonia (5.2%), malignant neoplasms of the prostate (2.6%), cirrhosis or other disorders of the liver (1.8%), chronic lower respiratory disorder (1.7%), and fluid/electrolyte disorders (1.5%).

Overall, these causes accounted for 339,480 years of life lost. HIV/AIDS accounted for the most (14.5%), followed by conditions originating in the perinatal period (12.1%), suicide (6.4%), homicide (4.6%), ischemic heart diseases (4.6%), cerebrovascular diseases (4.3%), land transport accidents (4.2%), diabetes (3.9%), influenza and pneumonia (3.6%), and intestinal infectious diseases (3.4%).

## HEALTH OF POPULATION GROUPS

### Children under 5 Years Old

This age group accounted for 12% (87,907) of the population in the 2002 census. There has been a decline in the number of live births over the past five-year period, with an estimated 18,537 live births in 2001 and 16,391 in 2004. Trained health personnel attended over 95% of these births, and approximately 90% took place in government hospitals and health centers. The crude birth rate in 2003 was 23.1 per 1,000 population. The most prevalent diseases reported were respiratory tract infections (39.2%), acute diarrheal diseases (18.8%), skin diseases (11.0%), worm infestations (8.9%), accidents and injuries (2.6%), eye infections (2.0%), asthma (1.3%), other oral problems (0.5%), and abscess (0.5%).

The infant mortality rate was 24.7 per 1,000 live births in 2004, with 340 registered deaths among children under age 1. In 2001–2003, an average of 203 infant deaths was registered per year. The infant mortality rate was listed at 17.5 per 1,000 live births in 2003. For the 2001–2004 period, hypoxia (22%), intestinal infections (18%), other perinatal conditions (13%), acute respiratory infections (11%), and congenital anomalies (9.8%) were the leading causes of mortality. The main causes of infant deaths are conditions originating in the perinatal period and respiratory problems of the newborn.

For the 2003–2004 period, the leading causes of infant deaths were respiratory disorders in the perinatal period (33%), bacterial sepsis of the newborn (11%), congenital malformations (11%), hemorrhagic and hematological disorders of fetus or newborn (6.5%), acute respiratory infections (5%), slow fetal growth (4.1%), intestinal infectious diseases (5.6%), newborns affected by obstetric complications (4.3%), nutritional deficiencies and nutritional anemia (2.8%), HIV-related conditions (2.9%), and all other causes (13.6%).

The neonatal mortality rate was 15 per 1,000 live births in 2004, with 72.3% of babies who died in the first year of life dying within 28 days of birth. Low birthweight is the greatest risk fac-

tor for neonatal mortality. In Guyana's primary referral hospital, the Georgetown Public Hospital Corporation, 12.7% of all newborns were of low birthweight (< 2,500 g), 1.5% of the newborns were of very low birthweight (< 1,500 g), and 0.6% had extremely low birthweight (< 1,000 g). The percentage of low-birthweight newborns declined from 18% in 2001 to 15% in 2004. The most recent five-year analysis of neonatal mortality at this hospital showed a 10% decline.

Premature babies made up 4% of all births, and neonatal sepsis occurrence in hospitals was low (0.7%). In 2004, the main reasons for infant visits to outpatient clinics at hospitals and health centers were acute respiratory infections (53.1%), skin disorders (8.1%), and scabies (7.0%).

The mortality rate for children under age 5 was 72 per 1,000 live births. The number of children in this age group who died during the 2001–2004 period was 414. The leading causes of death among 1–4-year-olds during the 2003–2004 period were intestinal infectious diseases (13%), acute respiratory infections (10.2%), undetermined injury (6.1%), congenital malformations (10.7%), HIV/AIDS (10.8%), and land traffic accidents (6.3%). Among 1–4-year-olds, acute respiratory infections (42%), helminthiasis (13%), skin conditions (8.0%), and accidents (5.5%) were the main reasons for visits to outpatient clinics.

The prevalence of moderate malnutrition from 2000 to 2004 was slightly lower in the age group of 0–11 months (12%) than in the age group of 12–23 months (15%). Only 0.8% in the first age group and 0.4% in the second age group were severely malnourished.

### Children 5–14 Years Old and Adolescents 15–19 Years Old

There were 95,723 children (12.9%) in the 5–9-year-old age group in the 2002 census; adolescents aged 10–14 years accounted for 10.8% (80,140), while 15–19-year-olds accounted for 8.9% (66,042). The 2004 Global School-based Student Health Survey focused on students in both primary and secondary schools. Fifty-one percent of those surveyed were females, and 49.0% were males. Results showed that 8.9% were overweight, with no difference between female and male students. The majority of those affected by this problem were in the 13–15 years age category. As many females as males (11.4% of all students surveyed) were at risk of becoming overweight. Three in four students practiced good dietary behavior. Hunger, though a small problem among these students (7.8%), was higher among male students (8.0%) than females (7.4%), but more pronounced among younger students (ages 13–15).

On an average, one in four students reported finding themselves in situations involving violent behavior (bullying, threats, use of weapons, physical fights). Many more males (1 in 3) than females (1 in 5) reported they had directly experienced a confrontation. One in two students was severely injured as a result of accidents.

The incidence of cigarette smoking and the use of other tobacco products were relatively low, being 7.0% and 8.0%, respectively; the male-to-female ratio was 3:1. One in two students attempted to quit smoking. Nearly one in three students consumed alcohol, while one in nine used drugs. One in two males and one in four females consumed alcohol, while one in six males and one in 17 females used drugs.

Only 69% of students (with more females (73%) than males (65%)) were taught about the benefits of a healthy diet, and only 47% of students were taught the importance of washing their hands.

Twenty-five percent of students had had sexual intercourse; 23% had had their first sexual experience between the ages of 13 and 15, and 39% had done so by age 16 or older. In addition, 16% of students had had sexual intercourse with multiple partners, with almost half of the females and three-quarters of the males surveyed having more than one partner. While the condom was the most common form of contraception (74%), overall contraceptive use was 76% among adolescents under age 15 and 71% among those 16 or older. Other methods of birth control were used, but the rate was relatively low (5.4%) and they were more frequently used by younger students than by older ones. In spite of the overall high rate of use of condoms and other methods of birth control, one in 26 female students became pregnant, while one in 10 male students claimed that they had made their partner pregnant.

### Adults 20–59 Years Old

The leading causes of death among males ages 20–59 for the 2001–2003 period were HIV/AIDS, with 653 deaths, or 16.4% of the total deaths defined by cause among males in this age group; followed by suicide, with 382 deaths (9.6%); ischemic heart diseases, with 324 deaths (8.1%); diabetes, with 168 deaths (4.2%); events or injuries of undetermined intent, 128 deaths (3.2%); and tuberculosis, 122 deaths (3.1%). The leading causes of death among females ages 20–59 years of age for the same period were HIV/AIDS, with 456 deaths, or 20.1% of the total deaths defined by cause among females in this age group; diabetes, with 237 deaths (10.4%); cerebrovascular diseases, with 181 deaths (8.0%); ischemic heart diseases, with 146 deaths (6.4%); malignant neoplasms of the uterus, with 91 deaths (4.0%); suicide, with 83 deaths (3.7%); heart failure, with 68 deaths (3.0%); malignant neoplasms of the breast, with 65 deaths (2.9%); hypertensive diseases, with 61 deaths (2.7%); and cirrhosis of the liver, with 58 deaths (2.6%).

### Older Adults 60 Years Old and Older

This age group increased from 3.9% in 1980 to 5.4% in 2002, another indication that the population is aging. The leading causes of death defined by cause among males 60 years old and

older for the 2001–2003 period were cerebrovascular diseases, with 595 deaths, or 17.7% of the total deaths among males in this age group; ischemic heart diseases, with 539 deaths (16.0%); diabetes, with 254 deaths (7.6%); hypertensive diseases, with 194 deaths (5.8%); heart failure, with 188 deaths (5.6%); influenza and pneumonia, with 182 deaths (5.4%); malignant neoplasms of the prostate, with 170 deaths (5.1%); cirrhosis and other diseases of the liver, with 91 deaths (2.7%); chronic lower respiratory diseases, with 71 deaths (2.1%); and tuberculosis, with 54 deaths (1.6%). The leading causes of death defined by cause among females 60 years of age and older for the same period were cerebrovascular diseases, with 562 deaths, or 17.9% of the total deaths among females in this age group; ischemic heart diseases, with 471 deaths (15.0%); diabetes, with 419 deaths (13.3%); hypertensive diseases, with 268 deaths (8.5%); heart failure, with 226 deaths (7.2%); influenza and pneumonia, with 154 deaths (4.9%); disorders of fluids and electrolytes, with 56 deaths (1.8%); malignant neoplasms of the uterus, with 50 deaths (1.6%); malignant neoplasms of the breast, with 46 deaths (1.5%); and diseases of the urinary system, with 41 deaths (1.3%).

### The Family

Nearly three-quarters of all households are headed by males. Family planning services are offered at health facilities, and contraceptives are available at all maternal and child health clinics. However, prevalence of contraceptive use among women aged 15–49 who are married or in long-term, single-partner relationships remains low at 37.5%. The Guyana Responsible Parenthood Association Report for 2004 indicated that oral contraceptives are the most frequently dispensed contraceptive in the country's maternal and child health clinics (58%), followed by condoms (23%), injections (17%), intrauterine devices (1.3%), and spermicides (0.6%).

According to the MICS, overall 81% of pregnant women received antenatal care from skilled personnel, with 90% of women from the coast—particularly the urban coast—receiving this care and only 49% of women in the hinterland areas. Approximately 95% of all deliveries were conducted or attended by trained personnel. Again, there was significant regional disparity, with only 43% of all births in the interior being attended by a trained professional.

Of the 46 deliveries by HIV-positive pregnant women, 61% (28) of the women and 78% (36) of the babies received nevirapine. Of the 46 babies born with HIV/AIDS during the reporting period, 29 (63%) received breast milk substitutes, 2 were breast-fed, 2 received mixed feeding (breast milk and formula), and the feeding choice for 9 babies is unknown. There was one stillbirth and 3 deaths from other causes.

There was a decline in the maternal mortality ratio over the 2000–2004 period from 133.3 per 100,000 live births (25) to 115.9 per 100,000 live births (19). For the 2000–2005 period, ap-

proximately 119 deaths of women due to obstetric complications were reported. The leading causes of maternal death in the two largest maternity wards in Guyana, which represent the majority of the maternal deaths recorded in this country, were: hemorrhages (32%), hypertensive diseases of pregnancy (21%), puerperal sepsis (13%), ectopic pregnancy (2%), and malaria (2%). There were 19 registered deaths reported by hospitals, attributed to hemorrhage during pregnancy and/or childbirth, hypertensive disorders during pregnancy, complications of labor and the puerperium, and existing medical conditions prior to pregnancy, including cardiac and respiratory problems.

While abortions are legal in Guyana, no services are available in public hospitals for elective abortion. The hospitals will provide care to patients with incomplete abortion in progress, proceeding with evacuation. There is also a relatively high number of women who seek health services with complaints of vaginal bleeding due to self-medication with prostaglandins (Cytotec). Maternal death rates due to abortion are low due to the ability of hospital maternity ward staff to effectively manage abortion situations. Between January and April 2005, a situational analysis was carried out at each of the country's two largest maternity wards. Findings revealed hospital deficiencies in the follow-up and complete utilization of protocols and in the standards and procedures for the management of pregnancy, childbirth, puerperium, and newborn care.

Breast-feeding is a traditional practice. For more than 90% of deliveries attended in the maternity wards, mothers begin breast-feeding within the first hour after giving birth. Seventy percent of newborns are exclusively breast-fed during the first month of life, while only 47% are exclusively breast-fed at four months. Ensuring skin-to-skin contact immediately following delivery is another traditional practice that occurs in nearly all births in both maternity wards.

### Workers

A 2004 survey of 133 working children in eight commercial communities found that most were involved in marketplace vending, agricultural, or fishing activities. While most appeared to be in reasonable health, a variety of the tasks they were required to perform raised safety and health issues. For example, the regular lifting of heavy objects increased their risk of back disorders and other injuries. They additionally reported being subjected at times to physical and sexual abuse, in the latter case thereby increasing their exposure to HIV/AIDS and other sexually transmitted infections. The children generally only sought medical care when their health problem had become a serious concern, indicating that many less pressing health issues went undetected and thus untreated.

In 2004, the total number of accidents reported to the Ministry of Labor's Occupational Safety and Health Division was 2,202, including 2,198 nonfatal accidents. The fatal accidents ranged from

14 in 2000 to 4 in 2004. Ninety-five percent of the nonfatal accidents in 2004 occurred in the agricultural sector, and about 2% occurred in the manufacturing sector. Despite the lack of data regarding work-related exposure to toxic pesticides, the extensive use of chemicals in agricultural enterprises indicates that this poses a significant threat to workers' health. Inadequate procedures for waste disposal, including chemicals, represent another risk factor to the health of Guyanese workers. Informal recycling takes place at the main landfill in Georgetown, which employs 121 persons who are exposed to a variety of safety risks and unhealthy conditions.

### Persons with Disabilities

The 2002 census identified 10,876 persons living with a disability (2.2% of the total population). A survey conducted in four of the country's administrative regions and based on a sample of 1,500 persons with disabilities found that 14% were totally socially excluded. Access to health services differed by type of impairment; those with physical and hearing impairments had better access to services (72% and 55%, respectively) than those with a hearing/speech impairment (44%) or learning impairment (27%). The survey also showed barriers in accessing health services in the hinterland (only 20–40% of the respondents in these regions had access to any type of rehabilitation services).

### Ethnic Groups

Amerindians, the predominant population group throughout most of the country's interior, are also the poorest social sector and exhibit some of the lowest health indicators in Guyana. Malaria is a serious health concern; 60% of all reported cases occur among the Amerindian population. Other health problems disproportionately affecting this group include dental caries, snake bites, scabies, worm infestation, substance abuse, and HIV/AIDS. At the same time, Amerindian women are at a higher risk of poor maternal health since fewer births in the interior are attended by trained health care workers. Community health workers are often the only type of providers serving the interior's population, and their work is hampered by transportation difficulties, lack of refrigeration, and staff shortages.

### Other Groups

Gold mining communities, located in Guyana's remote interior, are characterized by rapid population growth due to the influx of miners and those who provide services to them, as well as the lack of basic sanitary and waste disposal facilities. These conditions create the ideal setting for the emergence of vector-borne and other diseases.

Mining impacts on the physical and social environments of all surrounding areas and adversely affects population health. Some

of these factors are directly related to mining activities, such as chemical runoff into the water supply and the presence of unfilled pits of water that encourage mosquito breeding, while others are related to the social circumstances surrounding mining, such as temporary living accommodations without adequate sanitary facilities and transient relationships involving risky sexual behaviors. The social impact of mining is further seen in the imbalance of males to females in all mining communities, in the weakness of the family structure manifested by the high levels of unattached adults, and in the relative poverty that persists in the face of wealth generated in mining activities.

More than 50% of miners are affected by malaria. Campsites and housing for mining operations are usually situated in remote, forested areas, often otherwise uninhabited and with very difficult and often dangerous access. Despite these circumstances, antimalarial drugs are easily available through mining concessions.

## HEALTH CONDITIONS AND PROBLEMS

### COMMUNICABLE DISEASES

#### Vector-borne Diseases

**Malaria** is a major public health problem and remains endemic in the interior regions, particularly affecting the Amerindian population. For 2005, a total of 38,984 new cases were reported, of which *Plasmodium falciparum* represented 39% and *P. vivax* 54%. The average annual parasite index in 2005 was 173.95, while the percentage of malaria risk areas stood at 21.5%.

Since 2003, *P. malariae* strains have been diagnosed, corresponding to approximately 3% of all new cases. The majority of these cases (73%) occur in male adults. Malaria often goes untreated, especially in children, and many people have multiple episodes per year. Bed nets are used by 61% of children under age 5, but only 11% of the nets are treated with insecticide. Malaria is also thought to be a major contributory factor to anemia in women and children.

Since 2000, surveillance of **dengue fever** has improved, although weaknesses remain in overall case reporting and in reporting of circulating serotypes. In 2002, the largest number of cases (202) was recorded, and serotype 3 was identified. Information on the circulating serotypes for 2003 is not available. There have been only 2 reported cases of **dengue hemorrhagic fever** (DHF), both occurring in 2002. For the 2001–2005 period, there were no registered deaths due to DHF.

There were no reported cases of **leishmaniasis**, **schistosomiasis**, or **Chagas' disease** during the 2001–2005 review period. Clinical observations in some patients with cardiomegaly suggest the possible existence of cases of Chagas' disease; however the vector's presence has not been demonstrated, especially in the



coastal areas where the greatest percentage of the population is concentrated.

Surveys in 2001 demonstrated that more than 90% of Guyana's population is at risk of infection with **lymphatic filariasis**. In 2003, sentinel sites were established to monitor the effectiveness of salt fortified with diethylcarbamazine (DEC) in reducing transmission and prevalence of lymphatic filariasis. Evaluation of the two sentinel sites with the highest prevalence of lymphatic filariasis, using a baseline circulating filarial antigen card, showed 35% for Georgetown and 18% for New Amsterdam, while microfilaremia prevalence for these two areas was 11.4% and 2.6%, respectively.

### Vaccine-preventable Diseases

The immunization program in Guyana—which includes BCG, DPT, OPV, and MMR—has been very successful, with more than 80% of children receiving all the recommended vaccinations (excluding MMR) during the first 12 months of life. MMR vaccine is administered between 12 and 23 months of age, and an average of 91% of all children received it before age 23 months during the 2001–2005 period. DPT3 average coverage was 90% for the same period. Among children under age 1, BCG and OPV3 coverage averaged 94% and 92%, respectively, between 2001 and 2005. The pentavalent vaccine of DPT, hepatitis B, and *Haemophilus influenzae* type b (Hib) was introduced in 2001, and average coverage over the same five-year period was 90%.

There have been no confirmed cases of **measles**. The vaccination coverage for MMR and yellow fever was over 88%. Yellow fever vaccine continues to be part of the routine immunization schedule for children aged 12–23 months. The Expanded Program on Immunization national coverage from January 2004 to December 2005 revealed that coverage of children under age 1 for all antigens was more than 90%. **Poliomyelitis** has been eliminated, and there have been no confirmed cases of **neonatal tetanus**.

### Intestinal Infectious Diseases

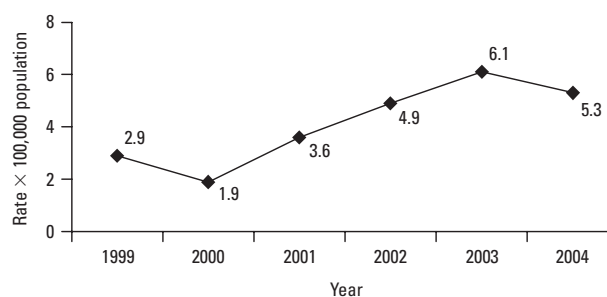
Statistical data from the Ministry of Health indicate that sections of the population in all 10 of Guyana's administrative regions are infected with **intestinal worms**. There have been no reported cases of **cholera** since the 1992–1993 outbreaks.

### Chronic Communicable Diseases

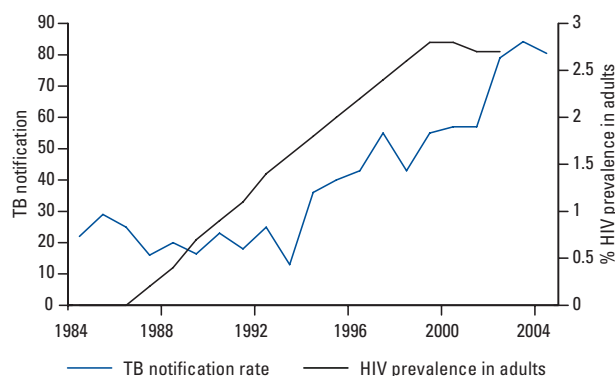
The incidence of **tuberculosis** (TB) has continued to increase, particularly since 2000. Coverage with the Directly Observed Treatment, Short Course (DOTS) strategy increased from 6.0% in 2000 to 42% in 2004; however, decentralization of the TB control program to the primary care level has not been achieved.

Mortality rates have also increased, from 3.6 in 2001 to 5.3 in 2004, as seen in Figure 2; this situation has been associated with TB/HIV coinfection. The TB notification rates and HIV prevalence rates in adults for the 1984–2004 period are presented in Figure 3.

**FIGURE 2. Tuberculosis mortality rates, Guyana, 1999–2004.**



**FIGURE 3. Tuberculosis notification rate and HIV prevalence in adults, Guyana, 1984–2004.**



The incidence rate is significantly greater in males, and the most affected age group is the 25–44-year-old population, with men contributing 57.7% of the cases and women 48.3% in 2004.

The TB new cases detection rate with ss + is still low, only reaching 27% in 2004. The cure rate of the case cohort under DOTS coverage in 2003 reached only 57%, diminishing in comparison with the rates for the two previous years, which had been 90% and 85%. In the areas not covered with the DOTS strategy the cure rate in 2003 was 50.9%, higher than that reached in the two previous years.

The prevalence of **Hansen's disease (leprosy)** increased from 0.9 in 2000 to 1.2 in 2004; the incidence rate also increased from 0.4 in 2000 to 0.5 in 2004, both increases in the indicators due to multibacillary forms. An average of 12% of the new cases presented with degree II disabilities at the time of diagnosis, indicating a late diagnosis. Self-referred cases accounted for 44.7% of the cases diagnosed; 21% were diagnosed through examined contacts; and 14.7% were patients referred by other health services for leprosy consultation.

### Acute Respiratory Infections

Acute respiratory infections (ARI) continue to play an important role in Guyana's morbidity and mortality patterns, occupying

first place in terms of the demand for health care services. Around 50,000 ARI cases are recorded annually; of these, more than 2,000 require hospitalization, and an average of 200 people die annually from ARIs. In 2003, 48,629 first visits to care were recorded, representing a rate of 6,553 per 100,000 population. In 2004, the number of visits increased to 53,262, with a rate that increased to 7,111 per 100,000 population. ARI mortality rates were 23.8 per 100,000 population in both 2003 and 2004. ARIs were the seventh leading cause of mortality in the under-1-year-old age group in 2003 and the fifth leading cause for this age group in 2004. They were the third leading cause in children ages 1–4 in 2003–2004.

### HIV/AIDS and Other Sexually Transmitted Infections

By the end of 2004, there were 7,512 officially recorded cases of persons testing positive for HIV, and the Joint United Nations Program on HIV/AIDS estimated that there was an adult prevalence of HIV infection of about 2.5% (range: 0.8%–7%) at that time. The findings of surveillance studies conducted among vulnerable populations suggest a stabilization of the epidemic. This is supported by reported cases and incidence data for the period between 1987 and 2004. With greater accessibility to health care centers offering voluntary counseling and treatment, more testing for HIV is being carried out by both the public and private sectors and nongovernmental organizations. Underreporting was a serious problem in the early years of the epidemic, and while significant underreporting remains a problem, this issue is gradually being addressed. In spite of increased testing, the number of new recorded cases remained relatively stable between 2001 and 2005. Data demonstrate that while men were more affected than women in the epidemic's early years, there is an increasing feminization of the epidemic, and today more women are recorded as being HIV positive than men, especially in the 15-to-24-year-old age group, which is the only one that recorded more female than male HIV infections during 2001–2004. More than 90% of the recorded cases occur among those between the ages of 15 and 49.

A government-sponsored program to prevent mother-to-child transmission of HIV (PMTCT) began in 2001 at 11 pilot sites and has grown to 56 sites in 8 of the country's 10 administrative regions. Since November 2001, more than 21,000 women have been offered testing and more than 18,000 have accepted. Uptake increased from 67% in 2002 to 94.6% in 2005. Almost 50% of pregnant women have access to PMTCT.

In 2005, the number of persons accessing the antiretroviral treatment program accelerated, rising from 13 per month at the beginning of the year to 23 per month by the end of the year, with a total of 986 persons on treatment in the national program. Laboratory services have expanded to include CD4 and viral load testing. These improved testing services have contributed to more informed decision-making and have resulted in significant clinical and immunological improvement for HIV-positive patients and those diagnosed with AIDS.

The number of annual AIDS-related deaths has slowed down and appears to have stabilized. Following a sharp upturn in the number of deaths between 1999 and 2000 (302 to 483), the crude death rate decreased to 49.8 in 2003, with the number of deaths remaining stable at 314.

### Zoonoses

A suspected human case of **rabies** was reported in 2001. In 2003 and 2004, 22 clinical diagnoses of rabies in cattle were reported. No cases in dogs were reported for those years. In May–June 2004, an outbreak of equine encephalitis was detected. Approximately 25 animal deaths were reported, and 3 human cases with symptoms were confirmed by the Caribbean Epidemiology Center laboratory. A vaccination campaign was implemented as a control measure. Guyana was certified free of foot-and-mouth disease in 2002.

## NONCOMMUNICABLE DISEASES

### Metabolic and Nutritional Diseases

The following risk groups have been identified in terms of food security: low income families, the indigent and homeless population, children 0–5 years of age, adults over age 65, and those infected with communicable diseases or affected by one or more noncommunicable chronic diseases. A 2003 nutrition and anthropometric survey conducted in nursery schools showed that 9.7% of children ages 3–4 were **underweight** for their age and 6.5% had **growth retardation (stunting)**. These indicators were 11% and 8.5%, respectively, in children ages 4–5. For the 5–6-year-old age group, 14% were underweight, 9.8% showed stunting, and 27% presented **anemia**, which was a marked improvement from previous study results. In 2002, a community consultation concluded that there was a generally high intake of macronutrients (energy, protein, and fats); it also noted differences by sex, geographic region, ethnicity, and age group; a high prevalence of **overweight**; and high intake levels of sugar and sodium. In a 2002 survey on physical activity, 69% of the participants were sedentary, with the index being greater among women and urban dwellers; only 20% said they exercised, with this practice being more frequent among men, as well as young professionals. A 2002 nutrition survey found that 6.4% of the respondents were underweight, 31% were overweight, and 19% were obese. **Obesity** was more frequent among women and people living in urban areas.

For the 2001–2004 period, an annual average of 8,433 new **diabetes** cases were reported. There were 6,832 persons, or 74% of the total population with diabetes, aged under 65 years, and some 2,400 (26%) were older than age 65. Available statistics indicate that twice as many females as males are affected; this may be due to the more sedentary lifestyles observed among females and more health-promoting behaviors seen among males. Unless

effective prevention strategies are implemented, the incidence of diabetes in Guyana will continue to rise, increasing the already high socioeconomic burden on families and the health system.

### Cardiovascular Diseases

In Guyana ischemic heart diseases were the second leading cause of death among both sexes. The number of deaths due to this cause was 1,491, comprising 10.3% of all deaths defined by cause for the 2001–2003 period. During the same time, the number of deaths among males from ischemic heart diseases was 866, or 10.4% of all deaths among males defined by cause; for females there were 625 deaths, or 10.1% of all deaths among females defined by cause.

### Malignant Neoplasms

The incidence rate of recorded cases of cancer (2,236) for the 2001–2005 period was 301.3 per 100,000 population. The annual incidence rate tended to increase over the period, which can be attributed to improvements in the case registry system. Breast cancer contributed 15.4% of the total incidence, prostate cancer 14.6%, and cervical cancer 12.9%. Other most-frequent cancer types were of the colon, stomach, lung, uterus, and liver, varying from 5.6% to 3.1%. These locations contributed 64% of the total number of recorded cases between 2001 and 2005. Of all the recorded cases, 1,295 (57.9%) were females, reflecting a high number of patients with breast and cervical cancer. The cumulative incidence rates for females were 352.8 per 100,000 population and for men, 251.1 per 100,000 population. Prostate, colon, and lung cancer were most common among males, while breast, cervix, and colon cancer were most common among females.

The cumulative cancer incidence rate in the infant population was very low—20.3 per 100,000 population, with 53 cases—for the 2000–2004 period. The main sites were the bone marrow, kidneys, blood, long bones of the lower limbs, and lymph nodes of the head, face, and neck.

Incidence rates are much higher in some areas than in others; this is particularly true along the coastline. This phenomenon might be attributable to the fact that in some regions health services are of higher quality and the levels of case investigation, diagnosis, and registration are higher in comparison with other lesser-served areas.

## OTHER HEALTH PROBLEMS OR ISSUES

### Disasters

A major widespread outbreak of leptospirosis occurred during the extensive flooding in 2005. Based on daily field surveillance by some 40 Ministry of Health mobile medical teams and hospital surveillance, 87 leptospirosis cases were reported. To prevent the disease's further spread, the Ministry provided weekly doxycycline prophylaxis for three weeks to the entire age-appropriate

population. There were 23 confirmed leptospirosis deaths registered during the flood disaster. There were 12 other deaths due to the flooding.

### Environmental Pollution

Due to the agricultural sector's high economic importance and its continued growth, the use of pesticides predominates and is consistently increasing as synthetic chemical pest control is promoted to enhance productivity. There is growing concern in the Ministries of Health, Agriculture, and Labor regarding the magnitude of acute pesticide poisonings. A 2005 workshop highlighted several occupation-related problems, such as the lack of safety education and use of protective equipment, the persistent use of various highly toxic pesticides, and the scarce resources available with which to implement regulation. A 2000 survey found that 66.9% of suicides are committed via ingestion of liquid poison, which is the predominant method chosen in heavy agriculture areas. Little is known about domestic poisonings and environmental exposure to pesticides.

Gold mining also impacts negatively on the physical and human environment due to traditional mining practices. Empirical surveys conducted during the mid-1990s confirm mercury contamination of soils, river sediments, rivers, fish, and residents of hinterland communities in both mining and adjacent non-mining areas. A major obstacle is that mining is a hinterland activity, thereby complicating environmental monitoring efforts for the Environmental Protection Agency (EPA) and the Guyana Geology and Mines Commission (GGMC), the agencies charged with the regulation of mining activities. The principal factors associated with elevated mercury levels include the lack of use by miners of specialized equipment designed to trap mercury vapor in the mines; amalgam burning and improper mercury storage in the home, which affects the health of miners' families; diet (consumption of fish three or four times weekly); and length of residence in a mining or adjacent non-mining community (residents of more than five years were seven times more likely to have mercury levels above 10 ppm). Goldsmiths also exhibit symptoms of mercury contamination due to inadequate use of safety gear, insufficient knowledge about chemicals and materials used in the workshops, and lack of adequate ventilation systems. Mercury exposure is significantly associated with hearing loss and paresthesia. There is no association between mercury concentration and sex or age.

### Oral Health

In 2005, 73,309 patients were seen nationwide in the public health system by a total workforce of 110 comprised of 22 dentists, 1 maxillo-facial specialist, 24 dental aides, 32 dentexes, 15 administrative and support staff, and 16 community dental therapists providing primary oral health services to schoolchildren and communities. Clinical preventive procedures, such as tooth cleaning, polishing, and topical fluoridation, have continued to

increase. Of importance was the introduction of pit and fissure sealants in Georgetown to prevent dental caries. The delivery of restorative care (tooth fillings) continued to grow, nationwide, with a total of 13,013 teeth filled in 2005, compared with 10,500 in 2004 and 6,774 in 2003. Health promotion continued to be a major focus; over 40,000 pupils nationwide were exposed in the classroom to relevant oral health messages; and mass promotion during Oral Health Month was sustained and consolidated in the administrative regions.

Schools and community outreach clinics have remained two key strategies to reach persons in need of dental care. The Rotary Club of Georgetown Central's School Program Mobile Unit allowed over 6,000 children of Regions 3 (Essequibo Islands-West Demarara) and 4 (Demarara-Mahaica), the latter of which includes Georgetown, to receive free dental care, including tooth extraction, prophylaxis, and fillings.

Efforts continued on the consolidation of the public oral health workforce with the recruitment of more dentists and the training of 27 dental auxiliary personnel. In May 2005, consolidation of cross-infection control in government clinics was achieved with the delivery and distribution to various clinics, including regional/district clinics, of 15 autoclaves.

The shortage of preventive/restorative materials and supplies has persisted, with no procurement made in 2005. At the same time, the absence of electricity in some isolated locations and the scarcity of portable generators have impeded the delivery of preventive and restorative care during outreach visits to rural and hinterland areas.

There are no available data on oral health in the private health sector.

## RESPONSE OF THE HEALTH SECTOR

### Health Policies and Plans

The overall objectives of the National Health Plan 2003–2007 are to improve the nation's health; to support the Poverty Reduction Strategy, the goals of the National Development Strategy, and the MDGs; and to achieve good value for money in the health sector. The National Health Plan focuses on the modernization and rationalization of health services, the decentralization of public health programs to Health Management Committees as semiautonomous providers, the establishment of workforce development and human resources management systems, and the implementation of a national quality framework.

The Plan identifies the following national priority programs: family health, communicable diseases, STI/HIV/AIDS, chronic noncommunicable diseases, oral health, and environmental health. Between 2003 and 2005, the Ministry of Health drafted a number of specific national policies, plans, and strategies to address priority health areas. They include the National Strategic Plan for the Reduction of Maternal and Neonatal Mortality in Guyana, the

National Mental Health Policy and Plan, the National Framework for Quality Care, the National Nursing Strategy, the National Blood Transfusion Policy, the National Strategy for Blood Safety, the National Plan for HIV/AIDS, and the Patient Charter of Rights and Obligations.

The Regional Health Authorities Act for the decentralization of services management, the Ministry of Health Act, and the Pharmacy Practitioners Act were passed during the 2003–2005 period. In addition, the Health Facility Act, indicating minimum standards for public and private health care facilities, was prepared by the Ministry of Health; the Water and Sewerage Act was passed in 2002; and the draft of the Health Protection and Promotion Act was submitted to Parliament by the Ministry of Health in 2005.

### Organization of the Health System

The main public institutions in the health sector are the Ministry of Health and the Ministry of Local Government and Regional Development. The overall responsibility for the population's health rests with the Minister of Health as the Ministry of Health's political head. The Permanent Secretary is the accounting officer and administrative head of the Ministry. The Chief Medical Officer oversees all technical and professional aspects. The Ministry of Health's sectoral responsibilities include policy formulation, standard setting, monitoring, evaluation, and the implementation of vertical programs. The Ministry of Local Government and Regional Development is responsible for financing and providing services at the regional level through the Regional Democratic Councils. The Ministry of Health provides technical support and some of the human resources to this effort. The private sector functions independently, but there is legislation through the Private Hospitals Act that provides for the licensing of private hospitals. Nongovernmental organizations are actively involved in services delivery, especially in the area of HIV/AIDS.

The Ministry of Health includes several entities with regulatory responsibilities. The Pharmacy and Poisons Board regulates pharmacies and pharmaceuticals, while the Government Analyst/Food and Drug Department is the regulatory authority for various aspects of food and drugs. Laboratory capacity for drug quality monitoring and potable water analysis was recently strengthened. The EPA has overall responsibility for the protection of the environment. The Directorate of Standards and Technical Services is responsible for the development of standards and quality control in clinical, pharmacy, radiography, laboratory, and blood transfusion services. The Guyana National Bureau of Standards regulates laboratories and blood banks, and preparations for accreditation of laboratories are in place. The professional councils (medical, dental, nursing, and pharmacy) regulate professional health practice, and continuing medical education is required for the annual registration of doctors. The Ministry of Health has a drug formulary and an Essential Drugs List, which is regularly updated.

The structure of Guyana's public health care system is highly decentralized. Administrative control over health resources in the regions rests with the Regional Executive Officers of the 10 Regional Democratic Councils (RDC). Each RDC has a Regional Health Officer who reports administratively to the Regional Executive Officers, but receives technical and professional guidance from the Ministry of Health. Experiences over the past decade have shown that the necessary health management skills available at the regional level are limited. The national referral hospital in Georgetown functions under the Public Corporation Act as a semiautonomous body with its own board.

The St. Joseph Mercy Hospital is a private facility that also offers treatment and care under the Ministry of Health's program. Care and treatment are offered free of charge to persons living with HIV/AIDS.

Guyana does not have a national health insurance system. The National Insurance Scheme operates a social insurance program for employees. Participation in the Scheme is mandatory for employed persons between the ages of 16 and 60, including the self-employed. The Scheme provides illness, maternity, medical care, and job-related injury benefits. Medical coverage is provided, on a reimbursable basis, for such selected services as hospitalization, eyeglasses, dental care, surgery, and the purchase of drugs, with limits on the reimbursement amount. Some employers provide additional contributory or non-contributory insurance for their employees. In other cases, individuals purchase health insurance from private insurance companies.

### Public Health Services

Guyana's health care system is based on the primary health care principles of equitable distribution of health services, intersectoral collaboration, and community participation. A major challenge is to ensure equitable access to health care for populations residing in small remote riverside and hinterlands settlements and to provide culturally appropriate intervention approaches for a wide range of ethnic groups. In collaboration with the Ministries of Amerindian Affairs and of Local Government and Regional Development, the Ministry of Health introduced the concept of community health workers (CHWs) in the late 1980s to strengthen the link between isolated villages and the formal health care system. Operating from small health posts, CHWs are often the only locally available health worker, forming a bridge with other levels of care. They are trained and supported by the Ministry of Health to provide community health promotion education and simple treatment and medications for common illnesses, in addition to child vaccinations.

The Ministry of Health is collaborating with donor agencies and the Pan American Health Organization (PAHO) to implement a lymphatic filariasis national elimination plan. The main strategies are public education, collaboration with salt manufacturers in

the distribution of DEC-fortified salt, community-mapping, and use of a more rapid diagnostic procedure for surveillance. After two years of preparation, DEC salt was launched in July 2003 with financial support from the Bill and Melinda Gates Foundation.

The Partners for Parasites Control was formed in 2001. Its participants include the PAHO/WHO Member Governments of countries in which helminthic infections are endemic, the United Nations Children's Fund, WHO, World Food Program, World Bank, universities, philanthropic foundations, and pharmaceutical companies. In May 2001, WHO World Health Assembly Resolution WHA 54.19 endorsed a strategy for the control of schistosomiasis and soil-transmitted helminths in high transmission areas. One of WHO's targets is the "regular treatment of at least 75% of all school-age children at risk of morbidity for schistosomiasis and soil-transmitted helminth infections by 2010." A draft proposal for the National Deworming Program for school-aged children was written in 2005 for implementation during 2006–2007.

As regards the country's HIV/AIDS program, treatment with antiretroviral medications (ARVs) commenced in April 2002 at one treatment center (the GUM Clinic). At the end of 2005, there were eight public health centers offering treatment and care, including the provision of ARVs and CD4 testing. Private physicians and hospitals also provide treatment, but these private arrangements have not yet become part of the national surveillance system.

A National Diabetes Strategic Plan has been developed with the aim of diabetes prevention, improving diabetes care, and decreasing the disease's burden in Guyana. The Plan describes priority areas for action in the current health care system; proposes goals, rationales, objectives, and evaluation measures for each of the areas; and provides an overall framework to guide diabetes prevention and control efforts for the 2007–2015 period.

The Government's water and sanitation sectoral strategy seeks to improve service level, increase efficiency, and achieve financial sustainability. Following initiation of GWI's five-year performance-based management contract in January 2003, considerable progress has been made towards implementing key institutional and regulatory water and sanitation reforms. The Public Utilities Commission, established as an independent regulatory body for the sector, requires capacity-strengthening to perform its functions. The National Water Council is not yet operational. The Ministry of Health and EPA have signed a Memorandum of Understanding to jointly develop water quality standards. At the same time, GWI, under license from the government, is required to supply safe drinking water in accordance with WHO standards. With PAHO support, the Ministry of Health plans to implement a region-by-region Water Safety Plan in Guyana.

Regarding the institutional framework of the solid waste management sector, the main stakeholders are the Georgetown Mayor and City Council, the other five existing municipalities (New Am-

## Prioritizing Equitable Environmental Services for All Guyanese

The Government of Guyana is giving priority to improving water and sanitation. The challenge is formidable, in large measure because of the population's geographic distribution and the state of the infrastructure. Nine in 10 Guyanese live in a narrow strip along the coast and one in five resides in the coastal capital of Georgetown; the remainder lives in the mostly remote underserved rural hinterland. Urban dwellers have significantly greater access to both water and sanitation services, although water quality throughout the country falls short of the minimum quality levels recommended by WHO. To redress these deficiencies, the Government passed a Water and Sewerage Act in 2002 and subsequently launched a National Health Plan for 2003–2007 that identifies environmental health as a key target to address.

sterdam, Corriverton, Anna Regina, Rose Hall, and Linden), and the NDCs. At the national level, entities involved in solid waste management are the Ministries of Health, Local Government and Regional Development, and Finance, along with the EPA. Non-governmental organizations and private contractors also play important roles in this sector.

Policy-making is a shared responsibility between the Ministry of Health and the Ministry of Local Government and Regional Development. The Ministry of Health and EPA share responsibility for the public health and environmental aspects of solid waste management. Through its Environmental Health Unit, the Ministry of Health is responsible for approving sanitary facilities and providing guidance to households, municipalities, industries, and other groups regarding adequate solid waste collection and disposal. The Ministry of Local Government and Regional Development is responsible for formulating national policy on solid waste management and providing financial support to municipalities and NDCs. At the current time, however, this institutional framework is not adequately coordinated and needs further strengthening. The Ministry has released a draft national solid waste policy, but institutional weakness has impeded the implementation of a technically sound and publicly supported policy.

The 2004 Sectoral Analysis of Solid Waste showed that many municipalities have deficient solid waste collection systems. Although coverage varies from 62% to 100%, the frequencies of collection rarely exceed the once-a-week minimum standard, and treatment/sanitary disposal is only performed on special restricted wastes.

It is estimated that 102,900 metric tons/year of solid waste will require adequate solid waste disposal if collection is to cover the entire population. However, only 63,700 metric tons of waste are deposited at the main landfill annually. The waste not delivered to the landfill is burned, buried, or disposed of in empty lots, canals, and approximately seven community dumpsites. There is no information on solid waste management in areas outside the capital city.

While the municipality of Georgetown possesses a Solid Waste Management Program, the other five municipalities have weak technical, administrative, and financial capabilities that are reflected in their inadequate waste collection and disposal. There are no recycling and composting activities in the country.

Special wastes, such as those from hospitals and slaughterhouses, are treated by burning, either in the open air in most municipalities or in a highly inadequate incinerator located in Georgetown. Since none of the methods are acceptable, there is an urgent need to implement technically sound and sustainable methodologies for hazardous wastes disposal.

There are several national initiatives under way to address the issue of mercury contamination and the destructive nature of mining activities. One notable example is the Guyana Environmental Capacity Development Mining Project aimed at strengthening the environmental management capacities of key stakeholders in the mining sector.

Air pollution has not been a priority issue in Guyana, though pollution from bauxite mining leads to chronic obstructive lung diseases among residents of mining and nearby communities.

The Veterinary Public Health (VPH) Unit of the Ministry of Health is responsible for setting standards and for monitoring, inspecting, and certifying the quality and safety of the production, processing, and distribution of all meat, seafood, milk, and related products, whether these are destined for local consumption, imported, or prepared for exportation. The Ministry of Health's Environmental Health Unit is responsible for ensuring that proper standards are maintained by regional-level food protection and control services. Food service inspections are carried out by Environmental Health Officers attached to municipalities and regional health departments.

The VPH Unit works in collaboration with the Ministry of Agriculture to establish and maintain epidemiological surveillance of zoonoses and minimize risks through appropriate disease control and eradication measures. The Unit also collaborates with the Environmental Health Unit; EPA; Georgetown's Mayor

and City Council; other Town Councils; Government Analyst/Food and Drug Department; Institute of Applied Science and Technology; Ministry of Fisheries, Crops, and Livestock; and the Guyana National Bureau of Standards. Collaborative efforts include providing prophylactic treatment to susceptible animals, raising public awareness, environmental monitoring, and inspection of supermarkets and marketplaces. There is also sharing of technical information, regulations, and laboratory facilities among these agencies. The VPH Unit establishes and maintains surveillance management over animal-derived foods and the detection of waterborne diseases; it also educates food handlers and processors about their important role in food protection and safety during all activities leading up to the consumer. Sanitary inspections and monitoring of fishing vessels are conducted twice annually. Implementation of the quality and safety assurances action plan for small- and medium-sized fish plants continues, and there is daily monitoring and evaluation of landing dock sanitary conditions and of raw fish products at the four major seafood establishments by VPH Unit inspectors.

Personnel assigned to landing dock sites and other fishing personnel received training on proper fish handling, and improvement of health facilities at these locations was carried out jointly with the European Union and the Caribbean Program for Economic Competitiveness. The VPH Unit provided training to seafood processors, landing site personnel, and fish handlers on Good Manufacturing Practices, Sanitation Standard Operating Procedures, and Hazard Analysis Critical Control Point systems, as well as orientation on new fishery regulations.

The VPH Unit and Guyana National Bureau of Standards held a joint meeting with poultry producers on the implementation of two poultry standards: Specifications for Poultry Meats and Poultry Products and Grading and Quality Requirements for Table Eggs.

The VPH coordinated a Food and Agriculture Organization project on the strengthening of the food control system in Guyana in which the Ministry of Agriculture serves as the implementing agency and the Ministry of Health as project coordinator. Technical work continued with the Guyana National Bureau of Standards to develop food standards.

A Healthy Market Project was initiated in 2005 with the Mayor and City Council of Georgetown for a small public market located on the capital's outskirts serving a diverse community of primarily medium to low income earners. A task force was established among stakeholders, including government and nongovernmental organizations, vendors, and private sector representatives, to address food safety, water, and sanitation issues.

Since its creation in October 2005, the National Committee on Influenza Preparedness has monitored the global spread of avian influenza. Led by the Ministry of Health, the Committee's other members include the Ministries of Agriculture, Home Affairs, and Education; University of Guyana; and Guyana Poultry Association, among others. The National Influenza Preparedness Plan focuses on minimizing and/or eliminating unwanted and unfore-

seen social disruption and economic consequences resulting from any possible pandemic influenza outbreak and on maximizing the effectiveness of the national response. As part of this effort, the national communication plan targets the general public, mass media, health workers, schools, workplaces, ports of entry, and communities. The Committee networks with other countries in the Region of the Americas to share information, identify funding sources, and establish a working group within the Global Framework for the Progressive Control of Transboundary Animal Diseases, a joint initiative of the Food and Agriculture Organization and the World Organization for Animal Health.

In response to the heavy flooding of early 2005, a Health Task Force was formed by the Ministry of Health in an effort to prevent the outbreak of diseases. The health response was guided by a syndromic surveillance system specially implemented during the flood. In February 2005, the Ministry introduced a mass chemoprophylaxis campaign, delivering some 450,000 courses of doxycycline (200 mg/day for 5 days) to residents of flood-affected areas. The local media reinforced this effort with comprehensive disease prevention messages targeted to vulnerable communities. Syndromic surveillance case report forms were revised to identify possible cases, and persons hospitalized with suspected leptospirosis were interviewed to assess clinical presentation and possible risk factors associated with the disease.

More than 5,000 persons were housed in 45 shelters run by the Guyana Defense Force (GDF), the Guyana Relief Council, and private organizations, with support from the World Food Program, Red Cross, and civil society and religious organizations such as Rotary Clubs. The Joint Services (JS) command center provided more than 146,000 hot meals, and more than 78,000 food hampers were distributed by government workers; 6,000 hampers were delivered to 22 mosques by the Central Islamic Organization. The Ministry of Health, JS, private contractors, Oxfam International, and international agencies supplied potable water to the affected communities through a network of water tanks, bottled water supplies, and community standpipes. The Ministry of Health and EPA organized an emergency water monitoring exercise to ensure safe water distribution. The GDF and Red Cross distributed 32,613 cleaning kits, which included soap powder, a scrub brush, washing soap, and bleach. Solid waste and sanitation responses were coordinated by a task force including the Ministry of Health, Ministry of Local Government and Regional Development, and the Georgetown Mayor and City Council. The relief assistance response from the international community was swift and amounted to greater than US\$ 3.7 million.

### Individual Care Services

Health services in the public sector are provided through a five-tiered, upward-moving referral system. Level I includes 188 health posts; level II, 136 health centers; level III, 20 district hospitals; level IV, 4 regional hospitals; and level V, the Georgetown

Public Hospital Corporation, which serves as the general hospital for the capital and surrounding areas and as the tertiary referral hospital for the country as a whole. Other level V care facilities include the national psychiatric hospital, the leprosarium, and the geriatric hospital. In the private sector, five hospitals and a variety of health and diagnostic centers and pharmacies exist. The vast majority of private facilities are located in Georgetown and other urban centers. There are 4.23 hospital beds per 1,000 population (3.77 in the public sector and 0.46 in the private sector). There is no organized ambulance service for the general population. The Georgetown Public Hospital Corporation, all of the regional hospitals, and some of the private hospitals provide ambulances for patient transport. Some private security firms also provide hospital ambulance services to their clients.

Public sector laboratories are located at the Georgetown Public Hospital Corporation, the four regional hospitals, and most of the 20 district hospitals. There are a limited number of private independent laboratories, some of which are combined with diagnostic imaging services. The National Blood Transfusion Service (NBTS) is governed by a semiautonomous board. In 2005, about 5,526 units of blood were collected countrywide; this filled approximately 64% of physicians' requests. In 2005, the NBTS, with support from the Red Cross, collected 82% of the blood supply, while the regional hospitals collected 13% and the private hospitals 5%. The NBTS tests all the units issued for transfusion for HIV, HBV, HCV, syphilis, and malaria. There is no screening for Chagas' disease.

Pursuant to the 2003–2007 National Health Plan, in 2004 the Ministry of Health's Division of Disability and Rehabilitation Services created a strategic plan to develop strategies for the provision of preventative, therapeutic, and rehabilitative services to the population. The Rehabilitation Services Program is comprised of the following components or sub-programs: Administration, Regional Physiotherapy, Occupational Therapy, Speech Therapy, Audiology, a home for the blind, and the National Vocational Training Center. Staffing in the rehabilitation services has been hampered by a high attrition rate of physiotherapists and assistants. The current profile indicates that services are mainly centrally based; the greatest proportion of the staff are mid-level workers known as Rehabilitation Assistants and Audiology Practitioners. There are a limited number of professional staff, mainly physiotherapists, the majority of whom are non-nationals. In 2004, there were 41 vacant positions, of which 52% were for technical personnel.

### Health Promotion

Guyana's health promotion framework is based on the Caribbean Charter for Health Promotion. At the same time, the new directions called for in the Bangkok Charter for Health Promotion (2005)—including greater policy coherence and the creation of partnerships across government sectors, the private sec-

tor, and civil society—continue to be progressively integrated into national development programs at the ministerial level. A diversity of multisectoral alliances have been established among public and private agencies and faith- and community-based organizations.

Within the Ministry of Health, health promotion strategies have been mainstreamed into the program areas of communicable and noncommunicable diseases, immunizations, maternal and child health, integrated management of childhood illness, adolescent health, and STI/HIV/AIDS. In addition, policies have been developed and implemented in these areas. In a new initiative, community health advocates were introduced to the health system following training in the early detection of diseases and in health promotion and prevention techniques that will allow them to address community health concerns such as diabetes and hypertensive diseases.

The Healthy Municipalities and Communities Program continues to expand with the inclusion of new communities in the hinterland and the establishment of health promotion committees tasked with developing, coordinating, and supporting various healthy setting initiatives in remote areas populated primarily by Amerindian groups. The health concerns of hinterland and suburban communities alike are increasingly being addressed through new intersectoral collaborations that enable the Program's strengthening.

The Ministry of Health established a Health Promotion Unit within the Adolescent and Young Adult Health and Wellness Unit to coordinate health promotion and healthy setting programs within the Ministry, and to support the Health Sciences and Education Division, focusing on addressing the determinants of adolescent health, particularly tobacco control and accidents and injury prevention. Health promotion in school curricula has been adapted by the Ministry of Education as a complementary framework for its Education for All by 2015 mandate. This has facilitated rapid assessments of schools conducted by teachers, students, parents, and other school community partners, as well as the development of action plans and the mobilization of resources to address the issues identified.

The Adolescent and Young Adult Health and Wellness Unit holds direct responsibility for the Ministry of Health's School Health Program, which is divided into two sub-programs; the first targets nursery and primary schools for children ages 3–12, and the second targets secondary and tertiary institutions with students ages 12 and over. In the latter case, a nationwide network of Health Clubs has been formed comprised of teachers and students who jointly address health issues within their individual schools, including tobacco control and reproductive health.

The School Health Program was initiated in 2001 as part of the Caribbean Network for Health-promoting Schools and has been adapted by the Ministry of Health as a strategy to improve the nation's health. Its participants include teachers, students, parents, and other school community partners who have fostered



recognition of the need for healthy public policies in schools. Among the group's achievements are formulation of a smoke-free schools policy and improvements in facilities in 35 schools located in areas affected by the 2005 floods.

A school-based Vision Screening Program was developed with the goal of reducing childhood blindness due to uncorrected refractive errors. Teachers, health care workers, and parents were trained to conduct screening activities at their respective schools. Referrals and assessments were made primarily at the Georgetown Public Hospital Corporation. Of 2,428 students screened during the 2005–2006 school year, 262 were referred for further assessment, and 36 of the 191 seen were prescribed eyeglasses and corrective lenses. This experience has provided valuable input for the implementation of other basic screening programs in auditory and oral health.

As a result of advocacy surrounding the observance of World Health Day 2004 and its slogan "Road Safety Is No Accident," the Ministry of Home Affairs spearheaded the resuscitation of the National Road Safety Council, which developed a national road safety program based on alliances among governmental ministries, nongovernmental organizations, and the private sector.

### Human Resources

External migration of health professionals—in all categories, including managers and health teachers/tutors—has created a serious workforce shortage in the health care field and placed constraints on health services provision to the population. In the public health sector, vacancy rates range between 25% and 50% in most professional categories. A geographical imbalance of professional staff also exists; 70% of the country's physicians are located in Georgetown, where only 25% of the population resides. For the medical specialties, Guyana relies largely on non-nationals, who fill more than 90% of the medical speciality positions in the public sector.

Another challenge is the low ratio of professionals to non-professionals. For nurses, this ratio was 0.60 in 2003 due to a high attrition rate of professional nurses. The professional nursing attrition rate in the public sector in the country's two most populous regions was 13% of the staffing level, while it was only 3%–4% for non-professional nursing. In some instances retired nurses are being rehired. The Ministry of Health has introduced various low- and mid-level cadres as a response to these challenges and as a way to ensure equitable access to care despite limited human resources.

The University of Guyana has a Faculty of Health Sciences with a School of Medicine and other departments which offer Bachelor of Science degrees in medical technology and nursing, and associate degrees in pharmacy, environmental health, and radiography. The University also plans to open a School of Dentistry. There are three public nursing schools—one in Georgetown and one each in the country's two other largest towns (Lin-

den and New Amsterdam)—as well as one private school at the St. Joseph Mercy Hospital in Georgetown.

The Ministry of Health Department of Health Sciences Education trains the lower- and mid-level cadres who serve primarily in rural areas. Training lasts 12–18 months and is provided for rural midwives, x-ray technicians, multipurpose technicians, community dental therapists, laboratory assistants, rehabilitation assistants, environmental health assistants, and for the medex (mid-level physician assistants).

### Health Sector Expenditures and Financing

In 2005, total government expenditure in health was approximately US\$ 34.2 million, or US\$ 45 per capita. This represents 7.9% of the total government expenditures (all sectors) and 4.4% of the GDP. Recurrent expenditure of the total government health expenditure was approximately US\$ 29.7 million, or 86.7%, in 2005, and capital expenditure was around 13.3%. Employment costs are about 38% of total government expenditure in health, and drugs and medical supplies are about 20.2%. No recent estimates of the total private expenditure in health are available.

From the recurrent government health expenditure, about 36.7% was allocated to the Georgetown Public Hospital Corporation and about 40% to the Regional Health Services. Most of the Regional Health Services are related to primary health care. However, the expenditure on these services includes an unspecified percentage of spending on secondary health care services that is provided through regional hospitals in some regions. Under the assumption that the expenditure on primary health care is at least one-third of the total expenditure in the regions (both through regional budgets and Regional Health Services), then primary health care expenditure represented at least 17% of total recurrent expenditure (public) in health in 2005, and 8% of the total capital expenditure (public) in health.

Health care is provided free of charge to the public. There are no data or information on financing in the private health sector.

### Technical Cooperation and External Financing

The municipality of Georgetown's Solid Waste Management Program has been financed by the Inter-American Development Bank since 2000. In 2005, PAHO provided technical support to the Ministry of Local Government and Regional Development in the development of final disposal/transfer sites of solid waste in the flood-affected areas along the east and west coasts of the Demerara River.

PAHO is also supporting the Ministry of Health in the development of an action plan to enhance the Environmental Health Unit's capacity and to review functions among other agencies in Guyana involved in environmental health issues. The Government Analyst/Food and Drug Department has also received support to

perform water quality analysis in the majority of parameters included in the WHO Guidelines for Drinking-water Quality.

Since 1999, the Rotary Club of Georgetown Central has been providing free dental services to schools and surrounding communities, utilizing one dentist, two dentexes, and a community dental therapist provided by the Ministry of Health. Intersectoral cooperation for health was strengthened during 2005. Colgate Palmolive and the Rotary Club of Georgetown Central have remained key partners, along with PAHO, which supported the participation of Ministry of Health dental personnel in two international conferences and in various activities related to Oral Health Month in 2005. Various overseas and local nongovernmental organizations continue to provide valuable support to the country's dental care delivery system through periodic outpatient clinic visits and financial contributions.

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