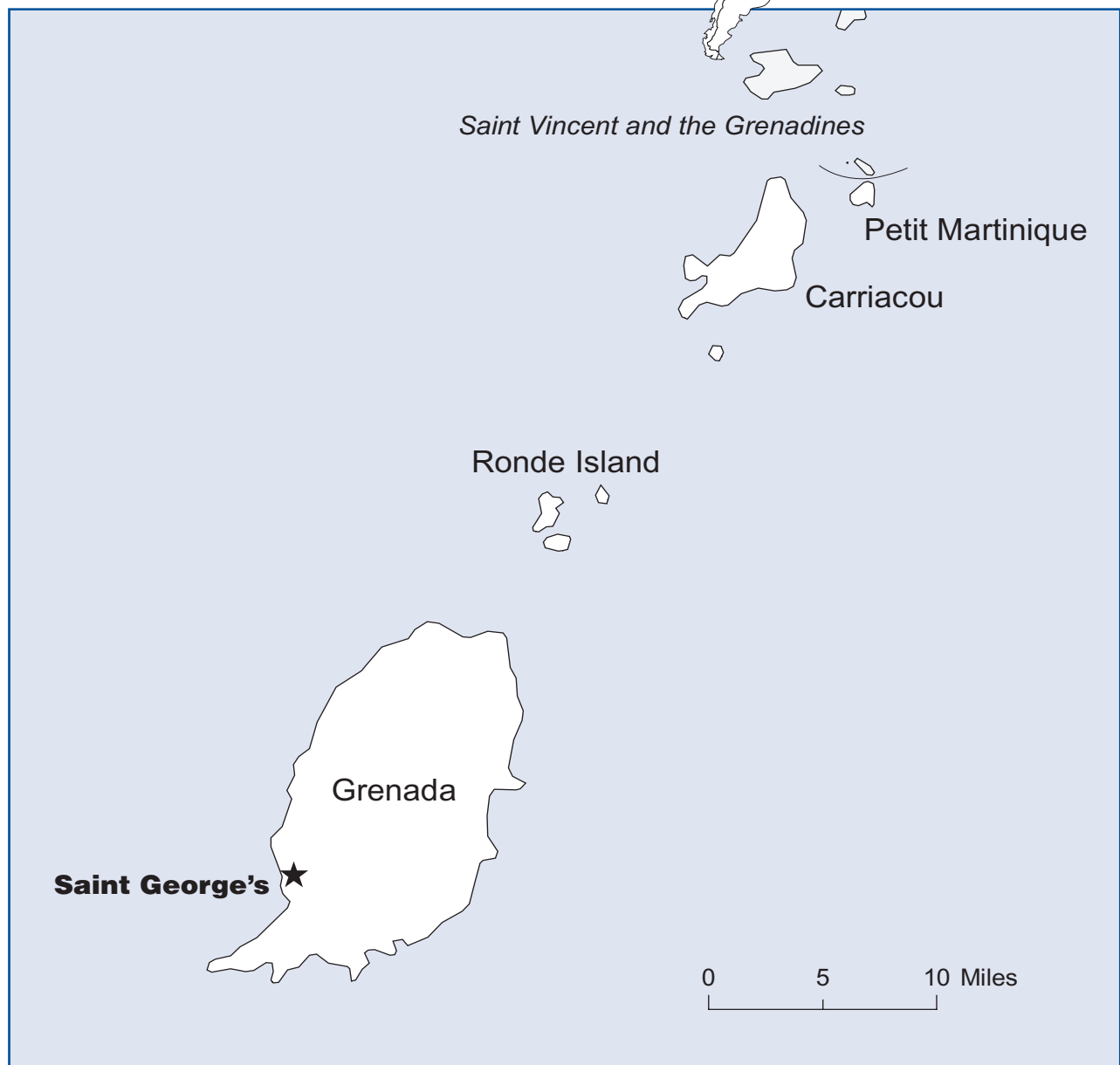


GRENADA



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, 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.

The State of Grenada includes the islands of Grenada, Carriacou, and Petit Martinique and covers a land area of 344 km². Grenada lies at the southern end of the Windward Islands, about 100 miles north of Venezuela and 90 miles southwest of Barbados.

GENERAL CONTEXT AND HEALTH DETERMINANTS

Social, Political, and Economic Determinants

Grenada is governed as a parliamentary democracy. The legislative branch is made up of a bicameral legislature composed of a 15-member elected House of Representatives and a 13-member appointed Senate. Executive powers are vested in the Prime Minister, as head of government, and in the Cabinet. The chief of state is the Governor General, who represents the British Crown. The country has several active political parties, and general elections are held every five years.

Since 1983, Grenada has enjoyed a stable political climate, which has paved the way for sustained economic growth and development, despite the country's small and open economy being vulnerable to the effects of global economic recession and natural disasters. According to data from the Ministry of Economic Affairs, after Grenada's decline in economic growth following the events of September 11, 2001, in the United States, the country began to experience economic recovery. In 2002 and 2003, the economy showed positive growth of 0.8% and 5.8%, respectively.

The results of the 2005 Core Welfare Indicators Survey show an adult literacy rate of 96%. Less than half of households with primary school-age children have easy access to primary schools and 24% have access to secondary schools. Access to schooling is defined in terms of time taken to reach a primary or secondary school; households within 15 minutes of a facility are defined as having easy access. According to the survey, urban households have easy access, while less than 30% of poor students from the rural areas have access. However, despite limited access enrollment figures exceed 90%.

Grenada's economy was dealt serious blows by hurricanes Ivan in 2004 and Emily in 2005. Hurricane Ivan, in particular, caused significant damage, especially to the housing sector where damages were estimated at US\$ 5.2 billion, or 58% of all damages sustained by the country. About 90% of the buildings were damaged and many persons lost their homes. There were 37 confirmed deaths and more than 300 injuries reported. Ivan's damage had important implications for Grenada's economy; as a result the agriculture and tourism sectors sustained negative growth of 6.9%. The health sector, as were most other sectors, was severely affected by hurricanes Ivan in 2004 and Emily in 2005. The over-

all estimated cost of damages to the health sector was US\$ 4 million, and many health facilities were damaged. Despite these setbacks, the Government continued to provide affordable, quality health care services to the population. By 2005, most of the damaged facilities had been repaired, refurbished, and recommissioned, with financial assistance from donor agencies, organizations and institutions, other governments, civic organizations, and individuals.

In 2005, the economy experienced a significant growth of 12.9%, and it was projected to grow by 7.4% in 2006. This robust performance was due to increased activities in construction, mining and quarrying, and tourism industries, which registered growth rates of 7.6%, 10.2%, and 54.5% respectively.

The average inflation rate for 2005 was 3.5%, driven mainly by recent increases in fuel prices. Fiscal performance in 2005 improved compared to that in 2004. Recurrent expenditures, on the other hand, fell by 10.6%, to US\$ 109 million, mainly due to lower interest payments. Savings on interest accounted for US\$ 18.4 million in 2005.

The active labor force represents two-thirds of the population. Unemployment is highest among the poor and the 15–29-year age group.

Prior to Hurricane Ivan the unemployment rate was 13%. With many persons losing their jobs as a result of the hurricane, the unemployed rate increased sharply thereafter. According to the 2005 Core Welfare Indicators Survey, the unemployment rate was 18.8% that year, and it was higher among women. In urban areas, female unemployment more than doubles the male rate. Nearly one-third of youths are unemployed, again with higher rates among females.

A waste inventory conducted in 2003 indicated that there were an estimated 30,000 tons of waste generated in Grenada. A breakdown by sector showed that organic waste accounted for 46.4% and 43.7% of waste generated by rural and urban residents, respectively; waste paper accounted for 17.9% and 19.5%, respectively. Rural areas generate more organic waste that is less damaging to the environment. Some urban waste may generate environmental hazards, but this impact has yet to be fully investigated. Based on the current per capita waste generation rate of 2.2 kg per person per day, it is projected that waste generation would be approximately 38,000 tons per annum by the year 2016. The projected level of waste generation poses a challenge to the

government in finding new/alternative disposal sites. Grenada has a very small land mass, and its hilly topography makes it extremely difficult to find alternative waste disposal sites.

A UNDP-sponsored Core Welfare Indicator Survey conducted in 2005 revealed that 87% of households have access to safe drinking water; 70% have access through publicly supplied water piped into the dwelling; 8.4% through publicly supplied water piped into the yard; and 8.5% through public standpipes.

In rural areas, 60.3% of the population has access to safe excreta and sewage disposal and sanitation services; 88.3% of urban households do. Septic tanks are used in 54.4% of households; 36.3% rely on pit latrines; 5.4% flushing toilets; and 0.7% have no access at all.

Of total households, 97% have access to a waste collection system. The Government's collection service offered by the Grenada Solid Waste Management Authority serves 87% of households; 1.1% of households rely on burning and crude dumping.

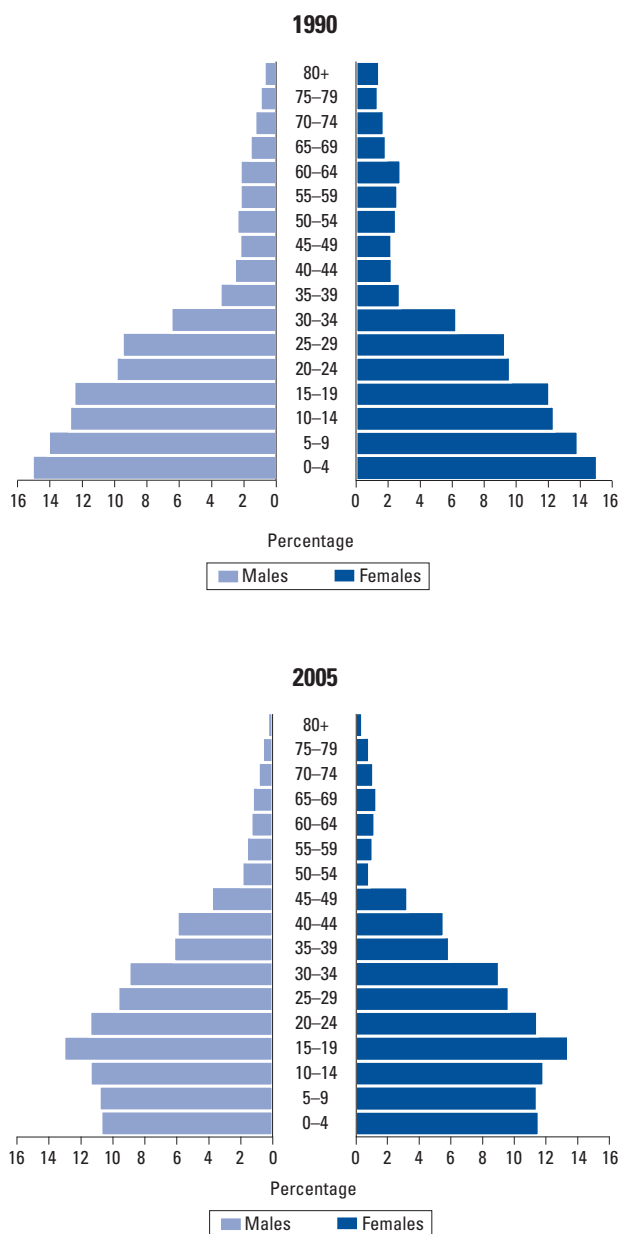
Demographics, Mortality, and Morbidity

In 2001, Grenada's population was estimated at 103,137. In 2005, the estimated population was 105,892, with an estimated growth rate of 2.6%. The population group under age 15 years represented 32% of the population and the group older than 64 represented 9%, for a dependency ratio of 71.5. (See Figure 1 for the country's population structure.)

In 2002, life expectancy was estimated at 71 years. Preliminary data show that between 2003 and 2005 the estimated average life expectancy increased to 73 years. An expected 10% increase in the group 65 years and older in the next decade will place added demand on health services, which may require large expenditures from the national budget. Consequently, the health systems will be required to develop supportive environments and appropriate services for this age group. In addition, the public health delivery system overall faces many development challenges, in part due to an increased demand for new technology with its escalating costs; additional challenges include health sector reform, health financing, and health information.

The number of recorded deaths in 2001–2005 was 3,230, for an average of 807 annual deaths. In 2002, the leading causes of death were diseases of the circulatory system (including diseases of pulmonary circulation and other forms of heart and cerebrovascular diseases), malignant neoplasms, diseases of the respiratory system, and parasitic diseases. Preliminary data from the General Hospital indicated that between 2003 and 2005 the leading causes of death were similar to those of the previous years. The number of deaths due to malignant neoplasms was 151 (24% of total deaths) in 2003, 45 (24%) in 2004, and 47 (21%) in 2005. Other leading causes of death in the period were due to endocrine and metabolic diseases, ischemic heart disease, diseases of the genitourinary system, and accidents and injuries.

FIGURE 1. Population structure, by age and sex, Grenada, 1990 and 2005.



HEALTH OF POPULATION GROUPS

Children under 5 Years Old

During 2002–2005, there were 107 infant deaths recorded, representing 27 annual deaths or 15 deaths per 1,000 live births. In the same period there were 50 neonatal deaths, averaging 12 annual deaths, or 7 deaths per 1,000 live births. Between 2003 and 2005, 3,683 (49%) of all acute respiratory infection cases oc-

curred in the age group 0–4 years old. Cases of gastroenteritis recorded for the same period (488) represented 45% of total cases. There were 18 infant deaths recorded in hospital records between 2004 and 2005. The leading causes of death among them were hypoxia, birth asphyxia, and respiratory conditions (8), acute respiratory infections (5), congenital heart disease (2), septicemia (1), broncho-aspiration (1), and diseases of the genitourinary system (1).

Community health reports indicate that between 2003 and 2005, 1,224 infants under 1 year old were seen at the country's clinics. Of that number, 450 (37%) were breast-fed exclusively for at least three months. In the same period, an average of 3% of these infants were found to be underweight or overweight. Among children aged 1–4 years, only 0.3% of 18,444 visiting clinics were underweight or overweight.

Children 5–9 Years Old

Two deaths were reported in this age group in 2004. One death was due to cerebrovascular disease; the other was due to disease of pulmonary circulation. No deaths were reported in 2005.

Adolescents 10–14 and 15–19 Years Old

The estimated population of 10–14-year-olds and 15–19-year-olds was 23,504 in 2005. Most attended school and appear to be in good health. Hospital data show that in 2004 there were no recorded deaths in these age groups. In 2005 one death was reported in the 15–19 age group, due to a malignant neoplasm. Between 2003 and 2005, the number of teenage mothers was 444, or 23% of total live births in 2003, 28% in 2004, and 32% in 2005.

Adults 20–59 and 60–64 Years Old

Grenada's labor force falls entirely in this age group, making it the most productive segment of the population. Hospital records indicate that between 2004 and 2005, there were 100 deaths in this age group, 61% males and 39% females. The three main causes of death were malignant neoplasms (27%), followed by diseases of the respiratory system (15%) and cerebrovascular diseases (13%).

Older Adults 65 Years Old and Older

The Ministry of Social Development is charged with providing services for Grenadians 65 years old and older. There are 11 homes for older adults in the country. The four homes owned and operated by the Government are Richmond Home, Grand Anse Home for the Aged, and Cadrona Home on mainland Grenada, and Top Hill on Carriacou. The Ministry of Social Development gives a monthly subsidy to the remaining privately owned and operated homes. Older adults are primarily affected

by chronic diseases such as diabetes, hypertension, and coronary or cardiovascular diseases and their complications.

In 2005, it was estimated that 9% of the population was older than 65 years, and this group is expected to increase by more than 10% in the next decade. As this population group increases in the coming years, the management of chronic diseases will pose a major challenge, as the demand grows for hospital services and services in the community. Grenada observed an International Day against the Abuse of the Elderly in 2006. A national policy on caring for the elderly has been drafted. This policy will protect the rights of older persons, ensuring that they can live with dignity and respect. It will also guarantee their involvement in national and community development and other social issues affecting their lives.

The Family

In 2003, 5,057 women received contraceptive injections and 1,557 received oral contraception at public health clinics. In 2004, 1,300 received injections and only 421 received oral contraceptives, representing a 74% and 73% decrease, respectively. This sharp drop is likely attributed to the disruption in services following Hurricane Ivan. The Grenada Planned Parenthood Association also provides reproductive health services. In 2004, 6,570 visits were recorded for services other than receiving contraceptives. Of these, 505 were for Pap smears, of which 12 were treated for minor infections and 45 were referred to a physician for follow-up care. That same year, 906 pregnancy tests were conducted; 283 were positive. In terms of contraceptive use, 241 new acceptors were recorded in 2004, compared to 216 in 2003; 149 of these were oral contraceptives and 77, injectable contraceptives. The intrauterine device (IUD) and other barrier methods are not widely used. There were 9,596 condoms distributed.

Workers

Data from the national insurance scheme indicates that between 2001 and 2005 a total of 16,323 new persons registered, at an average of 3,265 persons per annum. During 2002–2005 there were a total of 1,518 reported injuries. Of these, 478 (32%) occurred in construction, 333 (22%) in social and related services, 160 (11%) in the wholesale/retail sector, and 153 (10%) in restaurant and hotel services. In the same period, there were 403 trauma injuries, 226 lacerations, and 218 fractures reported. Of all injuries reported, 59% occurred between 2004 and 2005. This may be attributed to the increased activities in the construction industry to repair damage from Hurricane Ivan.

Persons with Disabilities

It is estimated that 10% of Grenada's population has some form of disability. In 1985, the Grenada National Council for the

Disabled was established to provide a forum where persons with disabilities could voice concerns and seek ways to address them, to sensitize the public about the plight of disabled persons, and to advocate for persons with disabilities. The Council is funded by the Government of Grenada and receives a subsidy through the Ministry of Social Development, which is charged with looking after the needs of and providing services to persons with disabilities. The Dorothy Hopkins Home and Bel Air Home, both in Saint George's, cater to children with disabilities.

Through its "Spice Project," the National Children's Home Action for Children provides day care and school services for children with disabilities in St. Mark's parish. There are also two special education schools, one in St. George's and one in St. Andrews. There is a school for the deaf in the St. George parish.

HEALTH CONDITIONS AND PROBLEMS

COMMUNICABLE DISEASES

Vector-borne Diseases

The Ministry of Health's Environmental Health Department aims to reduce the incidence of **malaria** and **dengue** through the control of their vectors, *Anopheles* and *Aedes aegypti* mosquitoes, respectively. One imported case of malaria was reported in 2005. Before that, the last two imported cases were confirmed in 1998. There is no active surveillance for the *Anopheles* mosquito, although some surveillance is conducted at sentinel sites, such as the General Hospital. In 2004, the house index¹ for the *Aedes aegypti* mosquito was 13.9%. By October 2005, the house index had dropped slightly, to 11.5%. In 2002, there were 310 confirmed positive dengue cases, for a rate of 3 per 100,000 inhabitants. This upsurge was due primarily to the introduction of Serotype 3 into the island and the commensurate increase in surveillance activities. In 2003, there were only four confirmed cases; in 2005, there were two.

Vaccine-preventable Diseases

The Ministry of Health continues to give priority to the country's immunization program. In 2001 ***Haemophilus influenzae* type b** and **hepatitis B** vaccines were introduced into the national immunization schedule through use of the pentavalent vaccine (DPT/HepB/Hib). During 2001–2005 there were no cases of **diphtheria**, **rubella**, **tetanus**, **neonatal tetanus**, or ***Haemophilus influenzae* type b**.

The vaccination coverage in 2001 to 2005 held above 90%, with the exception of 2004, when all programs were disrupted by Hurricane Ivan. In 2004, the coverage for the third dose of DPT, hepatitis B, and ***Haemophilus influenzae* type b**; OPV3; and MMR

vaccines was 84%, 84%, and 75%, respectively. In 2005, vaccination coverage was 100% for all three vaccines.

Intestinal Infectious Diseases

Throughout 2001–2005 the reported incidence of **gastroenteritis** continuously decreased. There were 1,566 cases of gastroenteritis reported in 2003, 1,376 in 2004, and 1,065 in 2005; 24% of cases occurred among the 5–14 age group.

Chronic Communicable Diseases

The incidence of bacilloscopy-positive **tuberculosis** cases in 2001–2005 was 12 per 100,000, compared to 4 per 100,000 in 2000. There were 7 cases of tuberculosis recorded in 2005; 2 each in 2002, 2003, and 2004; and 1 in 2001. There were three reported deaths due to the disease, one each in 2002, 2003, and 2004. The rise in the incidence of tuberculosis in 2005 may have been due to deteriorating living conditions after Hurricane Ivan. The majority of cases (8) fell within the age group 25–64 years old.

There were two confirmed cases of **leprosy** in 2001–2005, one male and one female in the same family. Both completed a regimen of Rifampicin, Clofloxamine, and Dapsone over 18 months, and are under surveillance to observe any resurgence of the infection.

Acute Respiratory Infections

Acute respiratory infections are one of the main causes of morbidity in Grenada. Hospital sources indicate that there were 9,170 reported cases in 2003, 8,605 in 2004, and 7,852 in 2005.

HIV/AIDS and Other Sexually Transmitted Infections

There were 75 persons who tested positive for **HIV infection** for the first time (49 males, 26 females) and 59 newly confirmed cases of **AIDS** (39 males, 20 females) between 2001 and 2005. The cumulative total up to 2005, since the first case was confirmed in 1984, stood at 277. Of these, 179 were males and 98 were females. The male to female ratio is 1.6:1. The most affected population group is persons between the ages of 15 and 45, the most productive population group. There were 158 AIDS-related deaths. Between 2000 and 2005, 12 infants were born to 10 HIV-infected mothers. Since then, three mothers have died and two of the children have tested HIV-positive. There are nine children living with AIDS.

According to hospital data, 319 cases of **gonorrhoea** were reported between 2003 and 2005, 133 in 2003, 119 in 2004, and 67 in 2005. In 2005, persons aged 15–44 were the most affected by the disease, 31 cases in the 15–24 group and 25 in the 25–44 group. The numbers of cases in these groups were similar in 2003 and 2004.

There were 150 cases of **syphilis** reported in 2004 and 35 in 2005. Those most affected by this disease in 2005 were persons 65 years old and older (15) followed by the age group 25–44 (8).

¹The ratio of the number of positive houses to total number of houses inspected.

Zoonoses

There were two cases of **leptosporosis** confirmed in 2004 and seven in 2005; the disease is of public health importance in the country. **Animal rabies** remains endemic in the mongoose population throughout Grenada. No human rabies cases have been reported since 1970.

NONCOMMUNICABLE DISEASES

Metabolic and Nutritional Diseases

According to results from the 2005 Grenada Food and Nutrition Council nutritional assessment of government-run and government-assisted day care centers, **underweight infants** ranged from a high of 6.6% in 2002 to a low of 1.8% in 2005; **overweight infants** ranged from 5.3% in 2002 to 9.0% in 2005.

There is a high prevalence of **iron deficiency** among children in Grenada. Iron deficiency tests conducted among one-year-olds showed that of those screened in 2003, 2004, and 2005, 65%, 62%, and 56%, respectively, were anemic, with hemoglobin levels under 11 g; more than 60% of these required iron supplementation. The prevalence of anemia among pregnant women screened at prenatal clinics during the same period showed that 14.3% had iron levels under 10 g in 2003, 9.6% did in 2004, and 15.1% did in 2005. Women whose iron levels ranged between 8 g and 10 g were 12.5% in 2003, 9.6% in 2004, and 13.5% in 2005; those whose iron levels were under 8 g were 2%, 6%, and 1.6% for those same years. During the same period, postnatal women with hemoglobin levels under 10 g were 3.2%, 5.2%, and 6.4%. The highest prevalence of anemia among pregnant women and one-year-old children was recorded in the parish of St. Andrews.

In 2004 and 2005 there were 35 deaths due to endocrine and metabolic diseases.

There were 1,726 cases of **diabetes** in 2003–2005.

Cardiovascular Diseases

According to hospital statistics, of the 8,061 cases of noncommunicable diseases recorded between 2003 and 2005, 1,407 were due to **hypertensive disease**. In 2004 and 2005, the leading causes of death were **cerebrovascular disease** (82 deaths), followed by **diseases of the pulmonary circulatory system and other forms of heart disease** (52), and **ischemic heart disease** (36). Cerebrovascular diseases represent 20% of all deaths recorded at the hospital. The age group 65 years old and older is the most affected.

Malignant Neoplasms

Between 2003 and 2005, there were 634 reported cases of malignant neoplasms, for an average of 211 cases per year. Most cases fell among persons aged 45 years old and older. In 2003, there were 41 cases of malignant neoplasm of the digestive system (24 males and 17 females); in 2004 there were 37 (32 males and 5 females) and in 2005, 28 (19 males and 9 females). In 2005,

there were 36 cases of malignant neoplasm of the hematopoietic and lymphatic system (19 males and 17 females); 29 cases were reported in 2004 (13 males and 16 females) and 28 in 2003 (19 males and 9 females).

In males 45 years old and older there is an increased prevalence of prostate cancer; 45 cases were reported in 2003 and 44 in 2004.

In females 45 years and older, there were 26 cases of malignant neoplasm of the uterus and 21 cases of malignant neoplasm of the breast reported for 2003; the numbers of malignant neoplasms of the uterus and of the breast were 21 and 19, respectively, in 2004, and 27 and 17, respectively, in 2005.

Violence and Other External Causes

Hospital discharges due to accidents and violence include accidental poisonings, falls, firearm accidents, road traffic accidents, homicides, and self-inflicted injuries. Data suggest that males are more frequently admitted to hospitals for accidents and violence.

Among total hospital discharges for males for 2001–2004, accidents and injuries increased from 9,695 (2.1% of the total) in 2001 to 10,928 (6.3%) in 2004. In 2003, there were 348 reported cases of accidents and injuries; the numbers for 2004 and 2005 were 336 and 512, respectively. The number of road traffic accidents was 1,321 in 2001, 1,484 in 2002, and 1,506 in 2003. The number of injuries in those same years was 236, 269, and 239, with 10, 6, and 8 fatalities. In 2003, there were 88 accidents due to motor vehicle and other transport; in 2004 there were 91. In 2005, the number rose to 129, an increase of 30%. This rise is due mainly to an increase in motor vehicles and other transport, as well as to improvements in road conditions. Reported accidents due to falls were 183 in 2003, 138 in 2004, and 223 in 2005. The spike in 2005 may be due to an increase in construction and home and building repairs after hurricanes Ivan and Emily. In 2005, accidental poisoning and punctures caused by machinery accounted for 25 and 22 cases, respectively. In 2003, 15 cases of suicide and self-inflicted injury were recorded; there were 10 in 2004 and 9 in 2005. In 2003–2005, the most cases were seen among young women 15–24 and 25–44 years old.

Oral Health

Dental services at the centers are provided mainly to persons 65 years old and older and to children. In 2003, 2,238 children and youth (5–19 years old) were examined for the first time: 99% of them were identified as having problems, 95% (2,023) of which received treatment. In 2003 and 2004, visits to dental services by persons 65 years old and older and younger adults were 6,318 and 5,015, respectively. Extractions and some restorative work are offered, but these services are constrained by a lack of regular equipment maintenance and supply shortages. Apart from the salt fluoridation program launched in the 1990s, the country has no caries prevention or dental health promotion programs.

RESPONSE OF THE HEALTH SECTOR

Health Policies and Plans

The Ministry of Finance, Planning, and Development coordinates Grenada's national development, guided by a three-year Medium Term Economic Strategic Plan that responds to economic considerations, including social development issues such as health care and gender equity. The Plan is prepared by the Ministry of Finance in collaboration with various ministries, including the Ministry of Health. The Ministry currently is guided by the 2006–2008 Medium Term Economic Strategic Plan.

Open discussions are being held with a wide range of stakeholders to establish a management information system that will more effectively monitor the country's social development and progress. The system's indicators focus on human resource development, quality health care, poverty reduction and elimination, rural development, sustainable use of the physical environment, and gender equity.

Although the Ministry of Health is responsible for providing health services to the population, the Ministry of Finance has final authority over all expenditures. The Department of Human Resources, under the Prime Minister's office, approves all public service staffing. The Public Services Commission selects, appoints, and determines terms and conditions of employment for all staff.

The Agency for Reconstruction and Development was established to foster cooperation among ministries, statutory bodies, the private sector, civil society, and international organizations in several activities aimed at restoring the population's livelihood after Hurricane Ivan. Various sectors of the economy participated in this effort, dubbed "Building Back Better."

The Ministry continues to update the regulatory framework for the control and improvement of the public health system. The most recent legislation enacted is the 2001 Waste Management Act, which provides for waste management in conformity with the best environmental practices. The law also provides for the development of a national waste management strategy.

The Road Traffic Act was amended in 2001, regulating the use of seatbelts in all public and private vehicles; the Act requires all persons sitting on the front seats of any vehicle to wear seatbelts. The Act also requires persons riding or driving a motorcycle to wear a protective helmet.

The 2002 Dog Registration and Control Act regulates the keeping of dogs and controls the importation and keeping of dangerous dogs or dogs kept for dangerous purposes.

The 2005 Noise Control Act regulates and controls excessive and unreasonable noise.

Health Strategies and Programs

Since 1998 the Government has embarked on a health sector reform program which continues today; it aims at improving ef-

iciency and effectiveness of the health services provided to the population. The reforms were mainly intended to deal with structural and institutional problems in the health care delivery system.

To cope with the escalating costs of providing acute care services, the Government will give greater emphasis to primary prevention by carrying out health promotion and educational activities. This effort is designed to encourage healthy lifestyles in the population, which will ultimately reduce the burden of disease and the demand for acute and rehabilitation services.

A new mental health policy and plan are also being developed to improve these services. Priority will be given to integrating the community mental health services into the primary care services. Emphasis will also be given to training personnel to staff mental services.

In 2002, the Government of Grenada received a grant from the Caribbean Development Bank for strengthening the hospital management system, including the review and development of policies and procedures manuals. An executive-agency model proposed for managing hospital services is now being gradually implemented. An executive management account was created for procuring goods and services. There is a Director of Hospital Services who manages all hospitals. The first phase of the hospital development project was completed and commissioned in January 2003. Work on the second phase of the project will begin soon.

In 2005 the Government began the process of developing a five-year national strategic plan for health under the theme "Health for Economic Growth and Development." This plan is expected to chart the way forward in health for the period 2006–2010. A health situational analysis has already been completed and priority areas identified that will serve as a baseline in the planning process.

An Environmental Affairs Department was established within the Ministry of Health in 2001, and an Environmental Protection Officer was appointed. The department is charged with facilitating the coordination, collaboration, and cooperation among stakeholders in the management of activities pertaining to Grenada's natural resources. The department is responsible for enforcing the institutional framework for environmental management and sustainable development to minimize indiscriminate potential adverse effects on human health and national development. It will also increase the level of public awareness on environmental issues in Grenada and facilitate the development of attitudes and skills necessary for community-based activities of environmental management.

The 2005 National Environmental Policy and Management Strategy complements and builds upon existing environmental policies and instruments to address environmental quality and sustainability issues. A draft environmental management bill is designed to enhance the efforts and scope of the 2001 Solid Waste Management Act. The legislation mainly relates to abating solid waste pollution. Part of the bill addresses environmental man-

“Building Back Better” after Hurricane Ivan

Grenada is especially vulnerable to hurricanes. Hurricane Ivan in 2004 proved to be one of the worst, leaving a toll of 37 deaths and more than 300 injured. Almost every structure sustained some damage, much of it severe. Damages to housing exceeded US\$ 5 billion. Countless Grenadians lost their homes. The agriculture and tourism sectors sustained damages, which seriously dampened the economy. Many health facilities also were struck, with damages to the health sector estimated at US\$ 4 million. In response to Hurricane Ivan’s devastation, the Government established the Agency for Reconstruction and Development in September 2004. Working under the motto “Building Back Better,” the agency served as an umbrella, coordinating the reconstruction work of ministries, statutory bodies, and elements of the private sector, civil society, and international organizations.

agement activities pertaining to marine issues, the movement of hazardous wastes, climate change, and marine-related conventions to which Grenada is a signatory (the Basel Convention on the Trans-boundary Movement of Hazardous Wastes and the Montreal Protocol, among others).

Organization of the Health System

The Ministry of Health, Social Security, the Environment, and Ecclesiastic Relations is responsible for the overall management of the health sector; it discharges its responsibilities through a centralized management. Within this structure, the Minister functions as the political head, the Permanent Secretary is the administrative head, and the Chief Medical Officer is the principal technical advisor on medical services. The Ministry is divided into three functional areas—Administration, Hospital Services, and Community Health Services. The Ministry’s administrative role is to formulate policies; enforce regulations; provide direction to programs; and oversee health and vital statistics, expenditures, inventory control, and personnel. The hospital services area comprises four acute care hospitals: General Hospital, Princess Alice Hospital, Princess Royal Hospital in Carriacou, and Mount Gay Psychiatric Hospital. Community Health Services, referred to as the primary/preventive care services, are provided at the district level. It is the first point of contact for anyone requiring health care services.

Grenada is divided into seven health districts—St. Andrews, St. George’s, St. John’s, St. Mark’s, St. Patrick’s, St. David’s, and Carriacou—six of which have a health center as their main primary care facility. There also are 30 medical stations distributed throughout the country, which are usually the first point of contact with the public health system. Every person has access to a health facility within a three-mile radius of his or her residence.

Each health district is managed by a District Medical Officer, various categories of nurses, dentists and dental auxiliaries, pharmacists, environmental health officers, and community mental health workers. Some facilities provide specialty services,

such as pediatrics, psychiatry, and chronic disease management. Grenada’s public sector hospitals include General Hospital in St. Georges; Princess Alice in St. Andrews; Princess Royal in Carriacou; and Mount Gay Psychiatric Hospital in St. George’s.

The Ministry of Health is responsible for the social security and national insurance scheme. Some persons have private individual or group health insurance, where contributions are made by both employer and employee. The Government is considering introducing a national health insurance scheme, offering a basic package of services as an alternative financing option.

Public Health Services

In 2002, the National AIDS Program was extended to include other sexually transmitted infections, and a national HIV/AIDS Prevention and Control project was launched under a National AIDS Directorate. A National Infectious Disease Control Unit also was established that year. In 2003, the Unit launched a counseling and testing program to prevent mother-to-child transmission, and a clinic was opened to conduct the testing. Antiretroviral drugs also were made available at no cost that year.

Grenada continues to implement strategies to control the spread of HIV/AIDS. As part of that effort, a volunteer counseling and testing program was established in 2005 to encourage persons infected with HIV to have checkups and tests to determine their health status. Since the program began, 34 persons have been trained to help carry out this activity.

In terms of controlling vector-borne diseases, chemical control of mosquitoes, focusing on high-risk areas, and health education programs are the two main thrusts of the effort. The widespread use of insecticides such as Malathion and Temephos over the last five decades or so continues to play an integral role in the control of *Aedes aegypti* mosquitoes.

The Environmental Health Department continues to work to reduce the incidence of animal rabies by conducting annual country-wide vaccination campaigns of domestic animals. In 2005 approximately 7,000 animals were vaccinated, representing

a success rate of just over 87% of the 8,000 animals targeted in the rabies vaccination program.

In addition, mongooses are trapped and laboratory-tested to estimate the incidence of rabies in animal communities, thereby maintaining the established barrier of rabies transmission from mongoose to man.

In 2005, the Department continued to ensure the availability of safe water through the water quality monitoring program that was instituted in 1998. In addition, reports of weekly bacteriological sampling conducted by the National Water and Sewerage Authority are reviewed and analyzed. Reviews of these bacteriological results show a general adherence to the water quality according to established standards.

The Environmental Health Department also continues to be responsible for overall sanitation; however, efforts are being made to relieve the Ministry of Health of these traditional roles and to function more in a monitoring and regulatory capacity.

One of the main functions of the Grenada Solid Waste Authority is to control all aspects of solid waste management in the country, with emphasis on efficiency and due regard to ecological and environmental factors.

The Government is revising the imposition of an environmental levy on imported filled and empty containers as a way to reduce the level of importation into the country. Consideration is also being given to the practice of reusing and recycling as a means of waste management.

The Environmental Health Department is responsible for controlling water pollution; improving wastewater treatment, ensuring that safe drinking water is delivered to the population; and identifying risks to health and safety within water catchment areas. The Department also is responsible for improving systems for the disposal of excreta and other harmful substances to humans, animals, and plants, as well as food hygiene.

Food safety activities continue to concentrate on the inspection of food service facilities, meats, and other foods, as well as providing ongoing education of food handlers. Plans are under way to strengthen the epidemiological surveillance of food-borne illnesses through improvements in the collection, collation, analysis, and interpretation of data. It should be noted that street food vending and the proliferation of itinerant food vendors in urban centers pose new challenges to Grenada's traditional method of inspecting food establishments. In 2004, there were approximately 600 itinerant food vendors registered with the Environmental Health Department. This sector of activity remains largely unregulated and new food safety practices, such as the application of Hazard Analysis Critical Control Principles (HACCP), are yet to be understood and adopted by the street vendors. Moreover, outbreaks of food-borne diseases are generally underreported. In the third quarter of 2002, for example, 56 cases were reported; only 10 were reported during the same period in 2003. No substantial changes occurred for the first quarter of 2004 (16 cases) and 2005 (15 cases).

The Grenada Food and Nutrition Council works closely with the ministries of Health and of Agriculture to implement joint programs to foster healthier eating habits and other lifestyle practices; it also monitors iron deficiency in pregnant women and children.

The events of September 11, 2001, underscored the vulnerability of Grenada's fragile economy to external influences. In response, the Government of Grenada put in place a food security program through the Ministry of Agriculture that was implemented in 2002. The program aims at ensuring some measure of self-sufficiency by increasing food production and the consumption of locally produced food—it is estimated that 90% of the food consumed in Grenada is imported. Farmers were provided with planting materials and livestock. Technical assistance and training were provided, including instruction on land preparation, use of fertilizers, types of animal feed, and other issues important to increased food and livestock production. Although most farmers were involved in the production of traditional crops, many new persons became involved and food production appears to be on the increase.

Individual Health Care Services

Individual health care services are provided mainly through public facilities, which offer outpatient, emergency, and inpatient services. The 198-bed General Hospital is the main referral hospital; it offers 24-hour accident and emergency and specialist services, including pediatric, surgical, internal medicine, obstetrics/gynecology, ophthalmic, oncology, psychiatric, orthopedic, and neurology services. Support services include laboratory, imaging, physiotherapy, rehabilitation, and social services. A 20-bed acute psychiatric unit that is part of General Hospital is the main admission unit for all patients requiring psychiatric services. The hospital also offers dietary and nutrition and ambulance services. The services are managed by an executive management team comprising a Director of Hospital Services, a Director of Medical Services, a Director of Nursing Services, and health services administrators from the Princess Alice Hospital, Princess Royal Hospital, and Richmond Hill Hospital.

In 2003–2005, 76,133 persons were seen at the General Hospital's accident and emergency department; 20,977 were admitted to the hospital, with an average length of stay of six days and an occupancy rate of 95%. Admissions and discharges are categorized by services. Of the total number of admissions in 2005, 2,107 (1,137 males, 970 females) were admitted to the medical wards, 1,785 (1,185 males, 600 females) to the surgical wards, 750 to gynecology, 1,653 to obstetrics, 1,364 (841 males, 523 females) to the pediatric ward, and 208 (123 males, 85 females) to ophthalmology; 1,183 were newborns.

The 60-bed Princess Alice Hospital is located in the rural parish of St. Andrews. It was seriously damaged by Hurricane Ivan and now has a reduced capacity of 20 beds. It provides sec-

ondary health care services with an emphasis on low-risk obstetrical, general medical, and minor surgical services, as well as stabilization of emergencies. The total number of persons seen at the accident and emergency department in 2004 and 2005 was 21,919; there were 2,820 admissions.

Princess Royal Hospital, a 40-bed secondary-care facility located on the island of Carriacou, also serves residents of Petit Martinique. It provides services similar to those provided by Princess Alice Hospital, as well as limited diagnostic services. Between 2003 and 2004, 5,892 persons were seen at the accident and emergency department, resulting in 1,002 hospital admissions.

The 80-bed Mt. Gay Hospital is the only long-stay mental health facility in Grenada. It provides psychiatric, psychotherapy, occupational and recreational therapy, and individual and family counseling services. Community mental health services are offered at various health centers throughout the country and provide follow-up and reevaluation of patients. Community mental health workers are assigned to each health district to provide follow-up care and treatment and ensure patient compliance and stability. There were 1,011 admissions to Mt. Gay Hospital between 2002 and 2005. Diagnostic categories are not available.

Carlton House is a 16-bed facility and the only substance-abuse treatment and rehabilitation center. This facility was severely damaged by Hurricane Ivan in 2004 and services have been suspended as a result. Between 2000 and 2004, 242 persons were admitted to Carlton House, 235 (96%) males and 7 (4%) females. Alcohol abuse was the reason for 43% of all admissions, while 31% were for multiple drug use, 16% for crack cocaine use, and 9% for marijuana abuse.

Specialty clinics in psychiatry, gynecology, chronic diseases, and sexually transmitted diseases are conducted at the hospitals and at the district level. In 2005, 9,475 patients were seen at General Hospital's specialty clinics. There were 3,184 patients admitted for obstetric/gynecological services, 2,303 for surgical-urological services, 1,860 for orthopedic services, 1,587 for medical services, 399 for maxillofacial services, and 142 for neurosurgery services. A range of services, mainly targeted to children, are provided by a visiting medical team from a United States organization, Children's Health Organization Relief and Educational Services (CHORES). The team comes to Grenada twice yearly to see new patients and provide follow-up care. In 2005, 163 patients were seen, 53.4% females and 46.6% males.

An oncology clinic staffed by a visiting oncologist was started in May 2005; between May and December 2005, 255 patients were seen at the clinic; 70% were females and 30% were males.

District Medical Officers refer persons seeking care in other specialties to the general hospital but there are long waiting times for such services. Referrals from other hospitals and health care facilities for admission are usually made via General Hospital's accident and emergency department. There is no formal system for follow-up and referral for patients discharged from General Hospital.

Mental health services provide treatment and rehabilitation for persons admitted to the Mental Hospital.

Health Promotion

The Ministry of Health's Health Promotion Department is responsible for coordinating the development, implementation, and evaluation of health promotion activities at the national, community, and organizational levels by strengthening health education efforts in the health sector and other sectors. The Department also provides leadership, technical expertise, and resources to strengthen community activities. The Department works closely with the Royal Grenada Police Force's Traffic Department to increase awareness of road safety. A workshop introducing the concepts of health education and health promotion was held for representatives from non-governmental organizations to encourage social participation which is critical to the advancement of health initiatives. A directory is now being developed to foster networking among community groups, non-governmental organizations, and related agencies. A teaching guide was produced to help teachers deliver information on sensitive issues and make them aware of innovative teaching methods.

Interventions have been applied to reach the various target populations through consultations on health issues, questionnaires, and various forms of mass communication activities. Healthy lifestyles were promoted through health screening programs, health walks, and school-based competitions. In addition, a study was conducted on the attitudes and the level of satisfaction of workers throughout the health system. The results of the study will help to plan appropriate programs to address problem areas.

Human Resources

In 2002, Grenada had 8.1 physicians per 10,000 population, the same ratio it had in 1997. The ratios of nurses (19.5 per 10,000) and dentists (1.1 per 10,000) also have remained at 1997 levels. In 1998, there were 6.9 pharmacists per 10,000 and 0.75 nutritionists per 10,000 population. Graduates of the schools of pharmacy and of nursing continue to come into the health system. In 2001, the Government implemented a policy of zero growth in the public service as part of a cost containment strategy. Special provisions are made for the employment of medical and nursing personnel on a contractual basis as needed.

Health Supplies

The Procurement Unit is responsible for obtaining, storing, and distributing pharmaceutical, medical and surgical, dental, x-ray, laboratory, domestic, and other health supplies needed for administrative functions. The Unit has developed a systematic and coordinated procurement process to ensure the cost-effectiveness of obtaining supplies, given that health supplies

account for between 20% and 25% of total expenditures for hospitals and community services. The purchase of drugs is centralized through the Regional Organization of Eastern Caribbean States Pharmaceutical Procurement Services (OECS/PPS), based in Saint Lucia, which allows for drugs to be purchased at competitive prices. About 85% of the drugs used in the public health sector are obtained through this service, based on a regional formulary which Grenada adapts as its national formulary. The formulary is updated every 18 months with agreement from national formulary committees of all member states. Procedures also are in place for requesting non-formulary drugs. All drugs and other supplies are stored at the Central Medical Supplies Department and are distributed through requisitions from the various departments. A donations policy is also in place to provide guidance for better collaboration and coordination with donors, to ensure that Grenada derives the greatest benefit possible from donations, and to maintain standards for the supply, delivery, and receipt of donated goods and for professional and technical services.

All high technology equipment is located at General Hospital, the main acute care hospital. The biomedical and the main maintenance unit also are located at General Hospital; the other hospitals have smaller maintenance units. These units are responsible for conducting preventive maintenance of all the country's health facilities. The second phase of construction of General Hospital is about to begin; the new facilities will be outfitted with modern equipment.

The public health laboratory is fully equipped; it and the imaging department are to be housed in a new facility.

The private sector provides some laboratory services; it is the sole provider of CT scans. Both the public and private sectors offer ultrasonograms, electrocardiograms, and mammograms.

Most public sector facilities are in reasonable condition. About 20% still need repairs, which will be completed over the next three years.

Health Sector Expenditures and Financing

The Ministry of Health receives its funding from general taxation through the Ministry of Finance's consolidated fund. International donor agencies, governments, charitable organizations, and individuals also help fund projects and programs. The management of public financing for health is the joint responsibility of the ministries of Health and of Finance, under the direction of Parliament and the Cabinet; it is part of the annual budgetary process.

Total public sector expenditure in 2003, 2004, and 2005 was US\$ 105 million, US\$ 121.3 million, and US\$ 108.5 million, respectively. Health expenditures for the same period were US\$ 14.5 million in 2003, US\$ 14.6 million in 2004, and US\$ 16.1 million in 2005. Data on expenditures show that health and education continue to consume, on average, 11.6% and 16.7%, respectively,

of the total recurrent budget. The estimated recurrent expenditure for 2006 is US\$ 120.8 million, with expenditures on health estimated at 12.09%. That same year, the per capita expenditure on health was US\$ 1,033. Hospital services receive a subsidy grant of approximately EC\$ 8 million annually for the provision of goods and services. Services provided at the hospitals are generally free, with nominal user fees for the use of private wards, operating theatres, diagnostic services, and prescription drugs for private bed patients; all fees collected are deposited into the consolidated fund.

External Technical Cooperation and Financing

The Ministry of Health continues to receive significant technical and financial assistance from PAHO/WHO, the Caribbean Development Bank through the Basic Need Trust Fund, USAID, Project Hope, the World Bank, and countries such as Cuba, New Zealand, Qatar, and Venezuela.

PAHO provides most of the technical and financial support towards health reform, environmental health, health promotion, and disease prevention. The Organization also provides short- and long-term fellowships. During hurricanes Ivan and Emily, PAHO mobilized funds to reconstruct the country's only public facility for the elderly, which had been severely damaged. Emergency funding also was provided for procuring supplies for the clinical laboratory and the vector control unit.

Project Hope made available US\$ 80,000 for a continuing education program for nurses and for acquiring computers, textbooks, and other supplies for the Grenada School of Nursing.

The Government of Cuba provides ongoing support for the General Hospital's biomedical department through trained biomedical engineers and technicians. However, because the Ministry has limited funds for preventive maintenance, the service provided by this department is curtailed by a lack of equipment and inadequate funding. Various funding agencies have provided financial assistance to refurbish both primary health and hospital facilities, especially in the aftermath of hurricanes Ivan and Emily.

USAID provided US\$ 340,000 to repair 11 community health facilities. The Government of New Zealand also provided funds to complete the construction of the Grenada School of Nursing, and the Caribbean Development Bank financed the refurbishment and reconstruction of six community health facilities. The Government of Venezuela has committed US\$ 13.5 million towards completing the construction of General Hospital's second phase.

Through the World Bank, funds were reallocated from HIV/AIDS to replace much needed equipment for the laboratory and for Woburn and Crochu Medical Stations and nurses' quarters at St. David's Health Center.

St. George's University has signed a memorandum of understanding with the Ministry of Health whereby the University awards five scholarships to Grenadians each year—two in medi-

cine and three in the masters in public health program. The University also provides US\$ 150,000 annually to hospital services for purchasing medical equipment. The University also cooperates with General Hospital in research and in providing medical assistance in specialist areas.

In 2005, Dalhousie University consultants undertook a review of the country's mental health services, with a view toward developing a national mental health policy and plan that will be part of the Five Year National Strategic Plan for Health.