INTRODUCTION

Grenada is a tri-island country comprising the island of Grenada and its dependencies, Carriacou and Petit Martinique, as well as several small, largely uninhabited islands. They are the southernmost of the Caribbean’s Windward Islands, located some 160 km north of Venezuela and 145 km southwest of Barbados. Grenada, the largest island, extends for 344 km²; its volcanic origins have given it a mountainous landscape and lush vegetation. St. George’s, the capital city, is located on the southwest of the island of Grenada. Grenada has an international airport and Carriacou, a small airport; Petit Martinique and the smaller islands are accessible by sea.

Grenada’s government is a stable parliamentary democracy based on the British model. The last elections were held in 2008; next elections are scheduled for 2013. Grenadians are predominantly
Christian, with a Roman Catholic majority. The official language is English.

In 2001, the country’s population was 103,137. The estimated population in 2006 was 105,735, with 52,080 males (49.3%) and 53,655 females (50.7%). In 2010, the estimated population was 111,764, with 55,748 males (49.8%) and 56,016 females (50.2%). In 2010, 29.3% of the population lived in urban areas (1). Figure 1 shows Grenada’s population distribution by age group and sex.

Total births decreased by 7.9% between 2006 and 2010. The total fertility rate per woman remained fairly constant at two children per woman, although there was a decrease in general fertility (see Table 1). Life expectancy at birth was 73 years in 2003–2005; in 2009 it decreased to 70 years, with females expected to live longer (73 years) than males (68 years). The rate of natural increase within the population declined from 10.4 per 1,000 population in 2006 to 8.2 in 2010 (2). The crude death rate in 2006 was 7.2 per 1,000 population and in 2010 it was 7.0 (3). The ratio of dependents (i.e., people younger than 15 or older than 64) to the working-age population (those between 15 and 64 years old) was 58 per 100 working-age population in 2006 and 53 in 2010 (4).

Grenada has a small, open economy that depends heavily on tourism, remittances, external aid, and exports of cocoa, nutmeg, and other spices. It is the world’s second largest nutmeg producer. In recent years the economy has benefited from the manufacture of paper products and electronic components, offshore financial services, and direct marketing.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total births</td>
<td>1,884</td>
<td>1,807</td>
<td>1,806</td>
<td>1,822</td>
<td>1,760</td>
</tr>
<tr>
<td>Live births</td>
<td>1,855</td>
<td>1,794</td>
<td>1,774</td>
<td>1,795</td>
<td>1,735</td>
</tr>
<tr>
<td>Birth rate (per 1,000 population)</td>
<td>17.7</td>
<td>17.0</td>
<td>16.5</td>
<td>16.7</td>
<td>15.5</td>
</tr>
<tr>
<td>Births to adolescents (percentage)</td>
<td>15.9</td>
<td>14.0</td>
<td>14.6</td>
<td>12.4</td>
<td>14.0</td>
</tr>
<tr>
<td>Fertility rate (per 10,000 population)</td>
<td>71.9</td>
<td>69.0</td>
<td>67.0</td>
<td>68.3</td>
<td>56.2</td>
</tr>
<tr>
<td>Fertility rate per woman</td>
<td>2.1</td>
<td>2.0</td>
<td>2.0</td>
<td>1.9</td>
<td>2.2</td>
</tr>
<tr>
<td>Total deaths</td>
<td>797</td>
<td>748</td>
<td>858</td>
<td>792</td>
<td>834</td>
</tr>
<tr>
<td>Crude death rate (per 1,000 population)</td>
<td>7.2</td>
<td>7.0</td>
<td>7.8</td>
<td>7.3</td>
<td>7.0</td>
</tr>
<tr>
<td>Rate of natural increase (per 1,000 population)</td>
<td>10.4</td>
<td>10.0</td>
<td>8.6</td>
<td>9.5</td>
<td>8.2</td>
</tr>
</tbody>
</table>

Source: Reference (2).
The country recorded positive economic growth of 1.3% in 2006, but by 2009, the economy showed negative growth (−7.7%). While there were improvements in 2010, growth was still negative (−1.3%). This contraction was due to the effects of the global economic crisis, which impacted such sectors as the local insurance and banking industry, causing the collapse of several financial institutions in the country. The decline also had damaging effects for construction (52.4%), mining and quarrying (29.9%), hotels and restaurants (20.8%), and wholesale and retail trade (17.9%). The gross domestic product (GDP) at constant prices in 2009 was US$ 593.7 million. The overall balance of payments position improved from a deficit of 4.0% of GDP in 2006 to a surplus of 4.2% in 2009 (3).

Activity in the tourism sector fluctuated between 2006 and 2010. Visitor arrivals on cruise ships increased following Hurricane Ivan in 2004 so that by 2007 revenue from tourism was US$ 106.7 million; this figure declined to US$ 92.1 million in 2010. In 2010, manufacturing increased by 35%; the agriculture sector grew by 9.3% in the same year, mainly through fishing and the production of fruits and vegetables (Grenada, Ministry of Education, 2010) (5). In 2007 remittances accounted for 30.7% of all income in the lowest quintile and 12.0% of household incomes overall (6). Between 2000 and 2010, remittances grew from US$ 27.4 million to US$ 28.4 million (3).

Public expenditure during the reporting period mainly aimed at assisting the population to return to normal conditions and to prevent a rise in poverty following the devastation caused by major hurricanes in 2004 and 2005. These storms damaged or destroyed 90% of buildings and devastated roads and other infrastructure. Total external debt in 2010 was US$ 666.6 million. Grenada benefited from external aid in this period and in 2008–2009 received grants totaling US$ 27.78 million (5). Annual per capita income fell from US$ 5,560 in 2006 to US$ 5,392 in 2009 (3), with implications for the livelihood and health status of many families.

Grenada has made advances toward achieving Millennium Development Goal 4 (to reduce by two-thirds, between 1990 and 2015, the under-5 mortality rate). The country has maintained 100% immunization coverage of vaccine-preventable diseases in infants under age 1, and had no reported cases of measles between 1991 and 2010. The infant mortality rate in 1990 was 17 per 1,000 live births but has steadily decreased: in 2006, the rate was 14.1, in 2007 it was 12.3, and in 2008 it was 11.3. In 2009 and 2010, the rates were 12.3 and 12.1, respectively. This represents a 29.5% decrease between 1990 and 2010. The mortality rate in children under age 5 decreased from 21 per 1,000 live births in 1990 to 11 in 2010, representing a 52.3% decrease over the past 20 years.

### HEALTH DETERMINANTS AND INEQUALITIES

Grenada conducted a country poverty assessment (CPA) in 2007/2008. The survey revealed that the percentage of poor had increased by 5.6% since 1998, but there was a sharp decline in the indigent poor from 12.9% in 1998 to 2.4% in 2008 (see Table 2). According to the CPA, in 2008 the poverty line for Grenada was US$ 2,164 per adult per year and the indigent line was US$ 887. The vulnerability line was estimated at 25% above the poverty line (US$ 2,704 per adult per year). Males were more at risk of being poor (39.5%) than females (36.2%), although unemployment was higher for females (31.8%) than for males (17.9%) (6).

The CPA’s analysis, by parish, showed that the highest incidences of poverty were in two adjacent parishes in the north of the island: St. Patrick’s (56.7%) and St. Marks (54.5%). The lowest

**TABLE 2. Poverty indicators, Grenada, 1998 and 2008.**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>1998</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of indigent poor</td>
<td>12.90</td>
<td>2.40</td>
</tr>
<tr>
<td>Percentage of poor</td>
<td>32.10</td>
<td>37.70</td>
</tr>
<tr>
<td>Percentage of vulnerable population</td>
<td>…</td>
<td>14.60</td>
</tr>
<tr>
<td>Gini coefficient</td>
<td>0.45</td>
<td>0.37</td>
</tr>
</tbody>
</table>

**Source:** Reference (6).

… Data not available.
incidence of poverty (6.5%) was in Carriacou, where most persons were self-employed in seafaring activities. The CPA also showed that in households where marriage was the union status, the odds of the household facing poverty fell by 67%. If the head of household had a secondary education, the odds of facing poverty were reduced by 43%. The average number of persons living in poor households was five, compared to the national average of three (6).

The majority of the employed worked in services and sales (22.8%), followed by crafts and related trades (20%), and elementary occupations (13.2%), including domestic help, other labor, and street vendors) (6). The CPA reported that the national unemployment rate was 24.9%; unemployment among the poor was 10 points above the national rate (34.9%). Youths between 15 and 24 years old accounted for 42.0% of all unemployed in Grenada. A significant number in this age group were employed as construction workers and lost their jobs as a result of the dramatic decline in this sector. There was, in fact, a 52.4% decline in construction activity between January and September 2009 and this decline continued into 2010 (5). Indeed, the Government estimated a 30.7% unemployment rate for 2010 (7). The high unemployment, coupled with the fact that 54.7% of the population was vulnerable to any impending shocks, has implications for families, particularly relating to their health status.

The housing stock in Grenada was greatly improved during the review period. Due to the devastation of the vast majority of houses during Hurricanes Ivan in 2004 and Emily in 2005, the Grenada Agency for Reconstruction and Development and several donor countries provided assistance to homeowners to rebuild or upgrade their homes. In 2006 alone, 500 homes were built, 300 were repaired, and 10,000 families received financial assistance toward housing. By the end of 2010 over US$ 110 million had been spent on housing (7).

The main premise of Grenada’s education policy is that every individual has the right to lifelong learning. In 2009 the education expenditure as a percentage of GDP was 5.53% (up from 4.63% in 2008), and represented 16.9% of the total budget (8). Enrollment in public preschools in 2008–2009 was 2,423 with a 1:1 ratio of boys to girls. Primary school education in Grenada is universal and enrollment stood at 93.8% for the 5–9-year age group and 97.2% for the 10–14-year age group; net enrollment was slightly higher for girls than boys. Approximately 16.5% of primary school students were absent from school at least one day every week. Secondary-school enrollment in 2008–2009 was 10,181; 51% of students were females (8). The Government provided support for needy children through school feeding programs, transportation, and the provision of books and uniforms (8).

There are three tertiary educational institutions on the island, namely St. George's University, University of the West Indies–Open Campus, and T.A. Marryshow Community College. In 2008–2009 there were 7,868 students, including foreigners, enrolled in these three institutions (8).

The increased investment in education bodes well for the well-being of the population in the future; with some effort Grenada will be able to achieve Millennium Development Goal 2 (universal primary education by the year 2015).

Grenada is committed to the preservation of human rights and protection of women from all forms of violence. The country is a signatory to regional and international conventions and agreements including the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW, 1990), the 1995 Beijing Declaration and Platform for Action, and the Inter-American Convention on the Prevention, Punishment, and Eradication of Violence (Convention of Belém do Pará, 1994). The country established the Domestic Violence Unit within the Ministry of Social Development in 2003, as a way to address the increasing incidence of domestic violence in Grenada. The Unit’s work was strengthened by national legislation, including the Domestic Violence Act (2010), the Criminal Code (Volume 1 of the Revised Laws of Grenada), and the Child Protection and Adoption Act (2010) (9). The results of the 2005 Core Welfare Indicators Survey, the
latest done, showed an adult literacy rate of 97.0% for both males and females (10).

According to the Country Poverty Assessment, the percentage of women having their first baby as teenagers declined as socioeconomic status improved: 57.8% of women in the lowest quintile reported having their first baby between 15 and 19 years of age, while 25% in the highest quintile reported this (6). Regardless, these figures still represent evidence of sexual abuse of young women which needs to be addressed.

THE ENVIRONMENT AND HUMAN SECURITY

ACCESS TO CLEAN WATER AND SANITATION

The population’s access to potable water in 2010 was 98%, with 95% having water piped to the house and 3% piped to the yard; the percentage of population still using standpipes was 2% (11). Public sewer service to the house was available for 8.2% of the population, 53.1% had access to septic tanks, 36.3% used pit latrines, and 2.4% did not have access to any excreta disposal facility. Among the poor, 66.6% used pit latrines.

Household inspections for environmental sanitation and the presence of mosquitoes continued, but staffing was inadequate to monitor all public health issues. Household mosquito indices ranged from 14.6 in 2008 to 13.9 in 2010, Breteau indices were 17.7 in 2008 and 14.7 in 2010, and container indices were 23 in 2008, 18 in 2009, and 21 in 2010 (11).

SOLID WASTE

Waste collection services were available for 98% of households. The Government’s collection service continued to serve 87% of households; 2% of households relied on burning and crude dumping while 11% relied on private waste collection companies. Commercial waste collection was contracted out to private enterprises (11).

THE WORK ENVIRONMENT AND WORKERS’ HEALTH

The Factory Act (No. 22) of 1973 is the only legislation that addresses occupational health and safety. The legislation is antiquated and a new policy framework needs to be established and the legislation revisited. Although occupational health and safety remained an issue of concern, the absence of a formalized program within an institutional structure hinders progress in this area (11). The Grenada National Insurance Scheme honored 2,374 claims for work-related injuries during the years 2006–2010, with trauma accounting for 17% of those claims (12).

ROAD SAFETY

There was no organized road-safety program within the Ministry of Health. Laws have been enacted that prohibit driving without seat belts and riding motorcycles without helmets. The seat belt act was passed in 2005 and legislation about the use of helmets was revised in the 1990s. A total of 12,593 road traffic accidents were reported during the period (1,935 in 2006 and 3,600 in 2010).

It is estimated that the number of vehicles in the country increased by at least 30,000 between 2006 and 2010 (13). Vehicles are inspected annually for roadworthiness, and a vehicle license is issued based on valid insurance for the vehicle. Driver’s licenses are renewed annually. The Royal Grenada Police Force assists with traffic at busy intersections where there are no traffic lights. Road safety tips and talks were aired on radio and television and police and health educators included road safety as a topic in schools and community outreach programs. The Royal Grenada Police Force also conducted a Road Safety Week each December.

VIOLENCE

Data from police records indicate an increase in the incidence of crime during 2006–2010. Categories of
violent crime are shown in Table 3. Of the 56 homicides committed between 2006 and 2010, 12 victims (21%) were female; females committed three homicides (5%). Victims of indecent assault, rape, and incest were assumed to be mainly females since these crimes are not customarily reported by males. In 2009, 233 incidents of domestic violence were reported to the police (13) and 131 were reported to the Ministry of Social Development (9). While these figures may include some double reporting, it is known that many crime incidents go unreported.

**Disasters**

After Hurricanes Ivan in 2004 and Emily in 2005, the country did not experience another natural disaster. In the ensuing years, disaster-response capacity was strengthened by upgrading the national disaster plan and establishing a memorandum of understanding regarding disaster response with stakeholders from both the private and public sectors. Consultations took place with all health sector participants, and health personnel received training in mass casualty management and emergency care and treatment. The General Hospital applied the PAHO/WHO Safe Hospital Index and developed a plan to improve its safety. Two community hospitals and the main health centers and medical stations also conducted vulnerability assessments. The health sector self-assessment tool was applied to identify disaster-preparedness gaps; remedial actions are under way to address these (2).

**Climate Change**

The Government of Grenada established a National Environmental Action Plan and instituted a legislative and policy framework for the management of environmental hazards. The action plan outlined strategies to address soil erosion, beach and coastline erosion, waste management, pollution, sedimentation of coastal and river waters, forestry and land protection, and potential loss of habitat and associated biodiversity. Grenada faces the serious challenge of preparing parts of its infrastructure for sea level rise in Carriacou, Petit Martinique, as well as in parts of Grenada. Grenada began to phase out imports of chlorofluorocarbons in 2006 (14).

**Food and Nutritional Security**

The cost of imported food rose considerably during the review period, largely due to inflation. In 2006, spending on food imports was US$ 47.86 million, an amount that rose to US$ 58.66 million by 2009. Of that, some US$ 38 million was spent on poultry and meat products (5). The Government worked with institutions and vulnerable persons (mainly from female-headed households) in 2008–2010 to promote subsistence farming. Some 3,000 persons received planting material, broilers, small ruminants, agricultural supplies, and gardening tools. The Government provided technical support for pest and disease control and for crop management (15).

**Health Conditions and Trends**

**Health Problems of Specific Population Groups**

Maternal and Reproductive Health

All health centers and medical stations in Grenada provide maternal and reproductive health care. There were 9,054 live births in the 2006–2010 period, and 99% of them took place at hospitals and birthing centers throughout the country. Trained

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**TABLE 3. Types of crimes reported, Grenada, 2006–2010.**

<table>
<thead>
<tr>
<th>Type of crime</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homicide</td>
<td>12</td>
<td>11</td>
<td>16</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Wounding</td>
<td>217</td>
<td>213</td>
<td>230</td>
<td>207</td>
<td>213</td>
</tr>
<tr>
<td>Indecent assault</td>
<td>42</td>
<td>61</td>
<td>83</td>
<td>87</td>
<td>77</td>
</tr>
<tr>
<td>Rape</td>
<td>22</td>
<td>30</td>
<td>31</td>
<td>57</td>
<td>32</td>
</tr>
<tr>
<td>Incest</td>
<td>2</td>
<td>7</td>
<td>5</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Defilement of female</td>
<td>32</td>
<td>55</td>
<td>48</td>
<td>59</td>
<td>36</td>
</tr>
</tbody>
</table>

Source: Reference (13).
health personnel attended all births. In 2009 there were 144 cesarean sections, representing 8% of births that year. A total of 6,096 clients attended antenatal clinics between 2006 and 2009; 25 of these clients were under the age of 15. Tetanus vaccine was administered to 1,509 clients during antenatal care; 371 pregnant females were diagnosed as anemic (hemoglobin below 10 g/dl); 19 tested positive for syphilis; and of the 1,375 Pap smears examined, there were 7 abnormal results. There were 5,441 postnatal sessions held at clinics and homes during 2006–2009. Women most frequently requested the contraceptive injection method (159 women in 2008 and 387 in 2009) (16).

Infants and Children (under 5 years old)

In 2010 there were 8,285 persons under 5 years old (7.4% of the population); 1,623 (19.5%) were under 1 year old and 6,662 (80.5%) were in the 1–4-year group. A total of 4,274 infants under 1 year old were enrolled in child health clinics during 2008–2010. Of these, 62.5% were taken to clinics before they were 6 weeks old. The percentage of infants exclusively breastfed for at least three months remained at 35%, although most infants were breastfed. Thirty percent of infants were overweight and 63% were moderately overweight; 7% were moderately undernourished. In 2009, coverage with DPT3 was 99.4% and coverage with measles and MMR was 100%. In 2010, 21 infants under 1 year old died; 18 of these deaths (85.7%) were attributed to conditions originating in the perinatal period.

Grenadian mothers continued to take their children to health clinics up to age 5. There were 20,303 clinic visits by children in the 1–4-year age group between 2007 and 2009; 171 of these children had abnormal weight-for-age (16). The leading morbidities in the under-5 age group were acute respiratory infections, skin conditions, and diarrheal diseases. The number of children referred to specialist care for these conditions increased from 49 in 2008 to 232 in 2009 (16). There were 22 deaths in the 1–4-year age group during 2006–2010 (4 in 2006, 4 in 2007, 6 in 2008, 4 in 2009, and 4 in 2010). The four deaths in 2010 were all males: one died from neoplasm, one from external causes, and two from undefined causes (2).

Children and Adolescents (5–19 years old)

In 2010, 30,601 persons (27.3% of the population) were between 5 and 19 years old; 19,296 (63.0%) were in the 5–14-year age group and 11,305 (37.0%) were in the 15–19-year age group (5,748 males and 5,557 females) (1). In 2010, approximately 74.0% of children received booster immunizations on entering primary school, an increase of 14% over the 2008 figure (16). For 2008–2009, the main cause of morbidity identified in this age group was accidents and injuries (4,704 reported cases). Traffic accidents accounted for 122 injuries, accidents in the home for 1,169, and unspecified external causes for 3,413. Other causes of morbidity were upper respiratory tract infections (2,837 cases), skin conditions (1,865 cases), and eye conditions (414 cases) (16). There were 12 deaths in this age group (9 males and 3 females); 2 of the deaths were caused by neoplasms (2).

Adults (20–59 years old)

Persons between 20 and 59 years old accounted for 54% (60,379) of the population in 2010. There were 32,397 males (53.6%) and 27,982 females (46.4%) (1). There were 28,843 adults and elderly persons who were screened at community health centers for specific conditions during 2008 and 2009. Among this group, the conditions most commonly diagnosed were hypertension, diabetes, and upper respiratory tract infections. Over 90% of persons afflicted with these diseases were over 40 years old. Diabetes affected 9.4% of adults over 20 years old while hypertension affected 7.25% (2). Deaths in the 20–59-year age group were mainly from diseases of the circulatory system (30.7%) and neoplasms (25.9%); “all other causes” accounted for 24.2% of deaths (2).

The Elderly (60 years old and older)

The age group 60 years old and older accounted for 11.3% of the population (12,526 persons) in 2010, a
4.8% increase over that age group’s proportion in 2006. Females accounted for 56.2% of that age group (7,038) and males for 43.8% (5,488) (1). Grenada has 12 geriatric homes, housing over 350 persons. Four are government-owned, five are government-subsidized, and three are privately owned. The Community Caregivers program, which caters to the needs of the elderly, falls under the purview of the Ministry of Social Development. Based on health center visits, the main morbidities of the elderly were hypertension (48.7%), diabetes (27.0%), accidents and injuries at home (7.0%), and upper respiratory infections (6.6%) (16). The most common causes of death in this age group were disorders of the circulatory system, neoplasms, and other noncommunicable diseases.

The Family

Family health continued to improve in Grenada. Over four-fifths of families (83.2%) owned their homes with or without mortgages; 90% used electricity; and water piped to dwelling houses increased from 66.2% in 2008 to 95% in 2010.

More households were headed by males (53%) than by females (47%) (6).

Mortality

There were 3,167 deaths during the 2006–2009 period; males accounted for 52.9% of them and females for 47.6%. The general mortality rate as reported by the Ministry of Health in 2009 was 7.46 per 1,000. The trend of higher male to female deaths continued in 2009, with the death rate for males estimated at 7.3 per 1,000 compared to 6.8 per 1,000 for females (2). The crude death rate was 7.2 in 2006 and 7.0 in 2009. The infant mortality rate decreased from 14.0 per 1,000 live births (26 deaths) in 2006 to 12.1 (21 deaths) in 2010. There was one maternal death during the 2006–2010 period; it was attributed to disseminated intravascular coagulation, as a result of acute anemia (2).

The 10 leading causes of mortality in Grenada between 2007 and 2009 were mainly due to noncommunicable diseases (see Table 4).

<table>
<thead>
<tr>
<th>Cause</th>
<th>2006</th>
<th></th>
<th>2010</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rank</td>
<td>Total</td>
<td>Percent</td>
<td>Rank</td>
</tr>
<tr>
<td>Malignant neoplasms</td>
<td>1</td>
<td>159</td>
<td>20.0</td>
<td>1</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>2</td>
<td>92</td>
<td>11.5</td>
<td>2</td>
</tr>
<tr>
<td>Diseases of pulmonary circulation and other forms of heart disease</td>
<td>3</td>
<td>84</td>
<td>10.5</td>
<td>3</td>
</tr>
<tr>
<td>Endocrine and metabolic diseases</td>
<td>4</td>
<td>66</td>
<td>8.3</td>
<td>4</td>
</tr>
<tr>
<td>Ischemic heart disease</td>
<td>5</td>
<td>62</td>
<td>7.8</td>
<td>5</td>
</tr>
<tr>
<td>External causes of morbidity and mortality</td>
<td>6</td>
<td>52</td>
<td>6.5</td>
<td>6</td>
</tr>
<tr>
<td>Diseases of the respiratory system</td>
<td>7</td>
<td>44</td>
<td>5.5</td>
<td>7</td>
</tr>
<tr>
<td>Diseases of the digestive system</td>
<td>8</td>
<td>24</td>
<td>3.1</td>
<td>8</td>
</tr>
<tr>
<td>Diseases of the genitourinary system</td>
<td>9</td>
<td>21</td>
<td>2.6</td>
<td>9</td>
</tr>
<tr>
<td>Certain conditions originating in the perinatal period</td>
<td>10</td>
<td>16</td>
<td>2.0</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>620</td>
<td>77.8</td>
<td>708</td>
<td>85.6</td>
</tr>
</tbody>
</table>

Source: Reference (2).
Malignant neoplasms were the leading cause of death for both males and females in 2007, 2008, and 2009. In 2009, malignant neoplasms accounted for 19.6% of all deaths for both sexes (56% of males and 44% of females). In that year, of the 94 deaths of males due to malignant neoplasms, 39 (41%) were due to neoplasms of the prostate, 21 (23%) to neoplasms of digestive organs, 8 (8.6%) to neoplasms of the respiratory organs, 8 (8.6%) to neoplasms of the intrathoracic organs, and 7 (7.6%) had lymphatic origins. The other 11 (11.7%) were related to other neoplasms. Of the 72 deaths of females due to malignant neoplasms in 2009, 20 (27.7%) were from neoplasms of the digestive system, 15 (20.8%) were neoplasms affecting genitourinary organs, 11 (15.3%) were caused by neoplasm of the breast, 11 (15.3%) from neoplasm of lymphoid tissues, 5 (6.9%) from neoplasm of hematopoietic tissues, and 10 (14.0%) were malignant neoplasms affecting other organs.^

**Morbidity**

Based on the 2010 discharge data from St. George’s General Hospital, noncommunicable diseases constituted 36.4% of discharges. Hospitalizations were primarily due to disorders of the circulatory system (2,291, or 18% of discharges); followed by endocrine and nutritional disorders (1,521, or 11.9% of discharges) and malignant neoplasms (823, or 6.5% of discharges). Data on problems first detected or reported by clients on their visits to community health centers indicate that 9,500, or 47.5% of visits, were for “other causes” and for “other unspecified” injuries. Following that, clients with hypertension accounted for the most visits (2,580, or 12.9% of visits); diabetes ranked third in the number of client visits (1,423, or 7.1%); and upper respiratory tract infections ranked fourth, with 972 visits (4.9%) (17).

**Communicable Diseases**

**Vector-borne Diseases**

In 2005, there were 14 reported cases of leptospirosis, followed by 3 cases in 2006, 4 in 2007, 4 in 2008, 7 in 2009, and 2 confirmed cases in 2010, both in males (2). In 2005, Grenada mounted an animal vaccination program against rabies which had an 87% success rate (17). There was one imported case of malaria in 2010 (male). There were 134 confirmed cases of dengue fever in 2010, affecting 70 (52%) males and 64 (48%) females. Prior to that, there were 14 confirmed dengue cases in 2006, 7 in 2007, 7 in 2008, and 28 in 2009, with 38 cases (67.8%) in persons under 15 years old (2). No cases of zoonoses were reported during 2006–2010.

**Vaccine-preventable Diseases**

There were no reported cases of vaccine-preventable diseases during 2005–2010 (2).

**HIV/AIDS and Other Sexually-transmitted Infections**

The Ministry of Health reported the incidence rate of HIV in 2009 as 13.5 per 100,000 population, with a male-to-female ratio of 1.5:1. The estimated prevalence rate of persons living with HIV/AIDS in Grenada in 2009 was 0.57%. At the end of 2009 a cumulative total of 403 HIV/AIDS cases had been confirmed in the country since 1984. More males have been affected by the disease, with a cumulative male-to-female ratio of 1.8:1. Among AIDS cases, 85 (70%) reported cases and 76 (82.6%) AIDS-related deaths were among persons between 15 and 44 years old. The mode of transmission was predominantly heterosexual intercourse and there were no known cases of transmission through intravenous drug use or blood transfusion. Antiretroviral therapy (ART) was provided free of cost to 54 persons with advanced HIV (29 males and 25 females). There were two cases of mother-to-child transmission of HIV, one in 2006 and one in 2007 (18). Six HIV-infected pregnant women received ART during 2008–2010. From 2006 to 2009 mortality from AIDS fluctuated: in 2006 there were 7 deaths; in 2007, 14 deaths; in 2008, 8 deaths; and in 2009, 7 deaths. In 2008 and 2009 there were 56 newly diagnosed HIV-positive cases (Grenada, Ministry of Health, 2010) and in 2010 there were 30 new cases of HIV (18 males and 12 females) (2).
Apart from HIV/AIDS, there were 823 cases of other sexually transmitted diseases in 2010. Candidiasis accounted for 503 cases (61.1%), syphilis for 283 cases (34.3%), gonococcal infections for 29 cases (3.5%), and Trichomonas vaginalis infection for 8 cases (1.1%) (2).

Tuberculosis

There were 19 confirmed cases of tuberculosis during 2006–2010. In 2006, incidence was 0.009 per 1,000 population. The incidence rate in 2009 was 0.04 per 1,000. In 2010, there were four confirmed tuberculosis cases (three males and one female) with an incidence rate of 0.03 per 1,000. Between 2008 and 2010, there were six recorded deaths due to tuberculosis, three (0.03 per 1,000) in 2008, two (0.02 per 1,000) in 2009, and one (0.009 per 1,000) in 2010 (2).

New and Emerging Diseases

There were 50 cases of influenza in 2008, compared to 203 in 2009; 28 cases (or 13.7%) were diagnosed as the H1N1 flu virus in 2009 (2).

Other Communicable Diseases

In 2010, there were 11,027 cases of acute respiratory infections, the highest for the reporting period; 5,038 cases (49.7%) occurred in children under 5 years old. In 2006, there were 6,748 cases and in 2008 there were 6,292. Ninety-four persons contracted food-borne illnesses in 2010, of whom 52 (55%) were males and 42 (45%) were females. In 2009 there were 2,416 cases of gastroenteritis, of which 857 (35.5%) were in children under age 5 (2).

Chronic, Noncommunicable Diseases

Noncommunicable diseases accounted for approximately 65% of total deaths each year in the 2006–2010 period. In 2005, diabetes was the most commonly reported condition followed by hypertensive disease, accidents, respiratory diseases, and cancer. In 2010, the most common conditions seen were related to cardiovascular disease (37%), hypertension (26%), diabetes (21%), and “other” noncommunicable diseases (16%). The STEPS Survey on Chronic Disease Risk Factors had not been completed for the reporting period, but risk factors cited were increased tobacco and alcohol use, decreased physical activity, and chronic infections of human papillomavirus and hepatitis (2).
(5.4%) had oral surgery, and 332 (2.6%) had oral health assessments (2).

**Persons with Disabilities**

Grenada has three special-education schools that cater to persons with disabilities with an enrollment of 146 (96 males and 50 females) (8). Most persons with disabilities are cared for at home by relatives with very little outside assistance.

**HEALTH POLICIES, THE HEALTH SYSTEM, AND SOCIAL PROTECTION**

**Health Policies**

In 2008, the Ministry of Health, Social Security, and the Environment’s portfolio changed to deal solely with health, becoming the Ministry of Health. Remaining portfolios were reassigned to other appropriate ministries, allowing the Ministry of Health to devote itself to health issues. The National AIDS Secretariat was transferred from the Office of the Prime Minister to the Ministry of Health.

**The Health System’s Performance**

Grenada’s National Insurance Scheme (NIC) provides benefits to workers to cover costs associated with work-related illness or injury, maternity leave, and retirement benefits, among others. There were 13,728 new registrants to the scheme between 2006 and 2010, with 1,542 registering in 2010. Nearly half (735) of the new enrollees in 2010 were between 16 and 24 years old. Most registrants worked in the construction, retail, and real estate sectors. The leading economic activities in 2010, based on active contributions to NIC, were social and related community services, roadside cleaning and maintenance (which was seasonal), and wholesale and retail trade (12). Only 7.4% of persons reported that they were covered by private health insurance (6).

**Health Legislation**

Legislation enacted during the reported period included the Noise Abatement Control Act of 2006, as well as the Child Protection and Adoption Bill and the Health Practitioner’s Act, both passed in 2010. In keeping with the 2002 Private Hospitals and Nursing Homes Act, a panel of inspectors was appointed to formulate and regulate standards for these facilities covered by the act. In addition, policies were put in place in 2006 to regulate the content and conduct of health fairs and in 2007, to address ethics on palliative care, and set standards for food served at government functions. Revision of the Mental Health Act commenced in 2010.

**Health Expenditures and Financing**

As part of the annual budgetary process, the Cabinet allocated and Parliament approved funds for the Ministry of Health. The Ministry received funding from the Ministry of Finance’s consolidated fund which is fed by general taxation and fees for service. Total public-sector expenditures in 2006, 2007, and 2008 were US$ 132.8 million, US$ 147.8 million, and US$ 182.8 million, respectively. Health expenditures for those same years were US$ 15.7 million (11.8% of total public-sector expenditures), US$ 16.9 million (11.4%), and US$ 18.6 million (10.1%), respectively. The estimated public-sector expenditure for 2009 was US$ 178.5 million, with health expenditures accounting for US$ 20.4 million (11.4%) (5). Data on expenditures for 2008–2010 indicate that health and education continued to consume, on average, 11.5% and 18.9%, of the total recurrent budget, respectively.

The estimated health budget averaged 3.1% to 3.5% of GDP, falling short of the 6% necessary to advance the health agenda. The budgetary shortfall was felt in areas such as primary health care and specialist services (2). In 2010, due to financial constraints, the Government opted to withdraw the annual subsidy grant to hospital services and to close the executive account that allowed for the procurement
of goods and services. Each hospital was then provided for as an individual cost center in the budgetary estimates, as had been done in the past. This is an indication that the attempt at financial devolution of the hospital services had not been successful.

A new fee structure was introduced in 2010 to ensure that there would be some cost recovery and sustainability in the health services. The new fees included the use of private wards, operating theatres, diagnostic services, and prescription drugs for private bed patients. All fees collected were deposited into the consolidated fund.

Apart from assistance with housing, the Government of Grenada spent approximately US$ 21.2 million, or 9.2% of total expenditure annually, in 2009 and 2010 on social safety net programs for the vulnerable population (5, 7). Programs targeted families who fell below the poverty line, children, pregnant women at risk, persons living with HIV and AIDS, and the elderly.

In the reporting period, the Public Assistance Program targeted 5,000 persons at a cost of US$ 370,370 annually. Funds were given to children to ensure that they remain in school by means of cash transfer made to the school or to the family. This program provided assistance to more than 1,450 students annually. The target population was children from poor and large families, those in child care homes and foster care, and those who did not attend school regularly. Pregnant women who were at risk for nutrient deficiencies were referred to the Grenada Food and Nutrition Council or to the dietitian at the hospital. As of 2011, antiretroviral treatment was provided to 172 HIV/AIDS patients at government expense and indigent persons with HIV were given monthly subsistence allowances. Between 2006 and 2010, cash transfers were made to the elderly, the mentally ill, and persons who were physically or mentally challenged. A total of 162 elderly persons benefited from the mobile caregivers program, which provided basic nursing care and assistance with house-keeping for the housebound. Burial assistance was granted to families whose relatives needed assistance to ensure a proper burial of their loved ones.

The Health Services

Grenada’s public health system includes four public hospitals and the community health service facilities. The General Hospital (198 beds) in St. George’s is the country’s main hospital; Princess Alice Hospital (56 beds) is located in St. Andrew’s, Princess Royal Hospital (40 beds) is in Carriacou, and Mt. Gay Psychiatric Hospital (100 beds) is located in St. George’s. The Government also operates the Richmond Home for the Elderly (100 beds). Hospitals provided support to all of the health centers and medical stations in the country and offered a wide range of services, including ambulance, laboratory, maternal health, radiology, obstetrics and gynecology, eye care and testing, dental care, and surgery.

The Community Health Service facilities include 6 district health centers and 30 medical stations that are all within about 5 km of their catchment population’s homes. These medical stations offer maternal-and-child-health and school-health services; medical, dental, psychiatric, and chronic disease clinic sessions; and pharmacy, health education, and counseling services.

The Environmental Health Department, also known as the Public Health Department, is responsible for, among other matters, food safety investigation; water quality; waste management; monitoring, control, and evaluation of the spread of infectious diseases; and investigation and control of hazardous materials. The Vector Control Unit monitored, investigated, and worked to eliminate various forms of vectors, such as the *Aedes aegypti* mosquitoes that cause dengue fever.

The amount spent on pharmaceuticals and medical supplies increased by almost US$ 736,000 from 2006 to 2010. The technological capacity of the General Hospital was enhanced in 2010 by the installation of a new Alcon Infinity Vision System for the benefit of ophthalmic surgeries at a cost of US$ 60,000, and new surgical C-arm equipment and an X-ray image intensifier at a cost of US$ 85,000.
KNOWLEDGE, TECHNOLOGY, INFORMATION, AND HUMAN RESOURCE MANAGEMENT

Scientific Production in Health

Grenada participated in the STEPS Survey on Chronic Disease Risk Factors in 2010 (which was not completed at the time of reporting) and completed a Burden of Illness study in 2008 on food-borne diseases. This study showed a 12.8% monthly prevalence for acute gastrointestinal illnesses, with *Salmonella enteritidis* being the main agent of contamination. The results pointed to the need to improve the surveillance system and implement prevention strategies to mitigate the cost burden of gastroenteritis (21).

No scientific papers on health were published during the reporting period, although the Grenada Medical Association produced two manuals for the continuing education of its members.

There were major gaps in the collection and tabulation of data in the health system during the 2006–2010 period. The data for the public sector were not continuous and, for the most part, were not comprehensive. The country had no data from private health facilities. Inadequacies in health information technology and connectivity at the disposal of health care providers at the hospitals, health centers, and medical stations limited the transfer of information and data from the reporting sites to the Health Information Unit based at the Ministry of Health (22). With assistance from PAHO/WHO, the Ministry conducted an analysis of the system in 2008, and created a strategic plan to develop a comprehensive health information system that will include the centralization of information through networking systems. The Ministry has since embarked on a program to computerize and strengthen the health information system (22).

Human Resources

Between 2003 and 2010 the Government of Grenada improved the available human resources for health in the public sector (see Table 5). However, given that noncommunicable diseases constitute the leading morbidities, there were insufficient nutritionists and allied staff capable of

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Number of workers</th>
<th>Population covered per worker</th>
<th>Number of workers</th>
<th>Population covered per worker</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical doctors</td>
<td>58</td>
<td>1,769</td>
<td>110</td>
<td>1,016</td>
</tr>
<tr>
<td>Nurses and midwives</td>
<td>220</td>
<td>467</td>
<td>356</td>
<td>314</td>
</tr>
<tr>
<td>Nursing assistants</td>
<td>146</td>
<td>703</td>
<td>173</td>
<td>646</td>
</tr>
<tr>
<td>Dentists and dental assistants</td>
<td>13</td>
<td>7,894</td>
<td>23</td>
<td>4,858</td>
</tr>
<tr>
<td>Pharmacists and pharmacy assistants</td>
<td>22</td>
<td>4,577</td>
<td>72</td>
<td>1,552</td>
</tr>
<tr>
<td>Social workers</td>
<td>4</td>
<td>25,658</td>
<td>20</td>
<td>5,587</td>
</tr>
<tr>
<td>Rehabilitation workers</td>
<td>2</td>
<td>51,316</td>
<td>4</td>
<td>27,937</td>
</tr>
<tr>
<td>Technicians</td>
<td>20</td>
<td>5,137</td>
<td>22</td>
<td>5,079</td>
</tr>
<tr>
<td>Environment health officers</td>
<td>15</td>
<td>6,842</td>
<td>20</td>
<td>5,587</td>
</tr>
<tr>
<td>Nutritionists/dietitians</td>
<td>1</td>
<td>102,632</td>
<td>9</td>
<td>12,416</td>
</tr>
<tr>
<td>Mental health practitioners</td>
<td>—</td>
<td>—</td>
<td>11</td>
<td>10,159</td>
</tr>
</tbody>
</table>

Source: Reference (2).
— Magnitude zero.
influencing dietary and lifestyle choices to meet the needs of the population. Moreover, staffing levels of social workers, rehabilitation staff, and mental health staff remained inadequate in the reporting period.

**HEALTH PERSONNEL TRAINING**

Educational programs in medicine, nursing, pharmacy, and other health care disciplines were available at St. George’s University in Grenada. In addition, several scholarships were awarded to Grenadian students to pursue studies in medicine, nursing, and the allied health professions at the University of the West Indies, various universities in Cuba, and universities elsewhere in the Region.

Continuing education and in-service training for health staff was ongoing throughout the reporting period. Training focused on a wide array of topics, including: disaster management, medical coding, maternal and child health, management of noncommunicable diseases, port health, water monitoring, and management of clients with dialysis.

**HEALTH AND INTERNATIONAL COOPERATION**

Grenada is a member of the Organization of Eastern Caribbean States (OECS), the Caribbean Community (CARICOM), and the British Commonwealth, and has established alliances with other regional and international organizations. Organizations such as PAHO/WHO and CAREC continued to provide technical and financial support for strengthening health systems, environmental health, health promotion and disease prevention, and disaster mitigation.

Major investments were needed for the reconstruction and repair of numerous health facilities that were destroyed or damaged by Hurricane Ivan in 2004 and Hurricane Emily in 2005. The two events affected 69% of the country’s health infrastructure, ranging from minor damage to medical stations to the total destruction of Princess Alice Hospital in St. Andrew’s. International donor agencies, governments, charitable organizations, and individuals assisted in the rebuilding by funding projects and programs through technical cooperation agreements. Between 2005 and 2007 the Caribbean Development Bank provided 100% financing through the Basic Needs Trust Fund for rebuilding or refurbishing Tivoli, Paraclete, and Crochu medical stations in the parish of St. Andrew’s; St. David Health Center in St. David’s; Woburn Medical Station in St. George’s; and Mt. Pleasant in Carriacou, at a cost of some US$ 200,000. The World Bank provided US$ 2.5 million in 2005/2006 for the rehabilitation of the main General Hospital, the Princess Alice Hospital, the Central Medical Stores, and vector-control buildings as well as other parish health centers. In addition, USAID and countries including Cuba, Venezuela, and the People’s Republic of China provided technical and financial assistance for repairing and rebuilding health facilities (2).

The Government of Cuba, through a technical cooperation agreement with the Government of Grenada, continued to provide support to the country’s health care delivery system. This agreement, which is still in force, is renewed annually and provides for the supply of Cuban medical and nursing specialists in various disciplines to complement existing services in Grenada. The Government of Cuba also provides scholarships for Grenadians to pursue training in various disciplines such as medicine, nursing, and pharmacy.

In 2006 the governments of Venezuela and Cuba established a partnership arrangement with the Government of Grenada to provide care and treatment for persons with eye conditions. The Government of Venezuela also provided financial assistance for the second phase of the General Hospital that includes the construction of an accident and emergency unit and diagnostic facilities.

In 2009/2010, Grenada received US$ 28.3 million in grants through the European Union’s Vulnerability Flex allocation. These funds were destined to assist with programs aimed at the most vulnerable population and to support the General Hospital as capital expenditure for purchasing equipment and supplies (2).
St. George’s University continued to strengthen its relationship with the Government of Grenada by building a partnership for sustainable development in health. Under a new agreement, the university will provide scholarships and grants to Grenadian students to pursue undergraduate and postgraduate studies in medicine, public health, and liberal arts. The university contributed to the General Hospital and other health facilities for the purchase of medical equipment and supplies and to subsidize hospital salaries.

SYNTHESIS AND PROSPECTS

Grenada’s recovery from the devastation caused by hurricanes Ivan and Emily is commendable. The country still grapples both with the economic losses from the hurricanes and the effects of the global economic crisis, however, which is evident in the high unemployment rate and the reduction in per capita income. On the plus side, the number of indigent poor significantly decreased, access to education improved, water supply and sanitation services progressed, and the country saw renewed interest in legislation benefiting women and children. Grenadians’ health status improved in meaningful ways: the death rate has fallen, maternal mortality is at zero, immunization coverage remains high, utilization at health centers has increased, and the number of persons living beyond 70 years has increased, helping fuel the aging of the population.

Noncommunicable diseases constitute the five leading causes of death, but communicable diseases are still of concern, teenage births continue to be high, and the number of persons affected by injuries and violence continues to rise. The country would benefit from placing focused emphasis on preventing noncommunicable diseases and on increasing health promotion, including bolstering the health and family life education content being taught in the schools, beginning in primary school. Health sector reform should include a comprehensive review of the primary health care approach and the building of stronger partnerships both within and external to the health sector (both public and private).

REFERENCES