INTRODUCTION

Belize is located in Central America; it shares a border with Mexico to the north, Guatemala to the west and south, and with the Caribbean Sea to the east. The total land area of Belize is 22,700 km². The country has a culturally diverse population estimated at 318,479 (159,462 males and 158,973 females) (1). Belize is comprised of six administrative districts: Belize, Cayo, Corozal, Orange Walk, Stann Creek, and Toledo. The country’s population is made up of four main ethnic groups: Creole, Garifuna, Maya, and mixed race, or mestizo. Table 1 shows the distribution of the population by ethnicity. Figure 1 shows the country’s population structure, by age and sex, for 1990 and 2010.

Toledo and Corozal, considered to be the country’s poorest districts, had household poverty rates of 46.4% and 46.1%, respectively (2). During the 2006–2010 reporting period, the per capita gross
domestic product (GDP) remained constant at around US$ 4,070, and the Belizean currency remained stable and pegged to the U.S. dollar (US$ 1.00 = BZ$ 2.00). The rate of inflation declined from 6.4% in 2008 to −1.1% in 2009, the lowest in more than a decade (2). Despite the austere economic climate, the Government continued to increase its commitment to public health by allocating a higher percentage of GDP to the health sector and strengthening alliances with domestic and international technical cooperation agencies.

HEALTH DETERMINANTS AND INEQUALITIES

Health inequities in Belize are best understood in terms of socioeconomic position, urban-versus-rural residence, gender, and ethnicity. According to the latest available data (2005), the adult literacy rate was 94.7% (94.6% male and 94.8% female) (2). In 2006, the Multiple Indicator Cluster Survey (3) found that only 58.7% of school-aged children attended secondary school.
Total life expectancy at birth increased from 69.3 years in 2006 to 76.9 years in 2010 (74.9 for males and 78.8 for females). The total fertility rate was 2.8 children per woman in 2010. The overall dependency ratio dropped from 81% in 2002 to 66% in 2009, owing to the decline in the child dependency ratio.

Forty-two percent of the country’s population was classified as poor,\(^1\) representing an increase over the 2002 rate (33.5%); 16.0% was classified as extremely poor. Poverty was greater in rural areas (55.0%) than in urban areas (28.0%). Notably, 50% of Belize’s children lived below the poverty line (2). Belize was not on track to achieve Millennium Development Goal (MDG) 1 (eradicate extreme hunger and poverty by 2015) (4). In 2009, Belize’s unemployment rate was 23.1%, representing a 2.8% increase over its 2000 level. Even though female participation in higher education exceeded male participation by a ratio of 2:1, the unemployment rate for women doubled that for men (16.7%) in 2009. That same year, unemployment was highest in Cayo (26.2%), followed by Corozal (24.5%). In 2003, the Government introduced a non-contributory pension for women older than 65 years as a way to combat poverty. In 2007, this benefit was extended to men over age 67 (5).

**THE ENVIRONMENT AND HUMAN SECURITY**

**Access to Clean Water and Sanitation**

As of 2010, more than 25% of Belizean urban and rural households did not have access to a regular supply of potable water. In Toledo district, 10.3% of households relied on rivers, ponds, streams, creeks, and springs as their primary source of water. This is the highest figure in the country (the national average is 2.1%), and it makes Toledo particularly vulnerable to water-borne diseases. In 2009, 73.5% of the country’s households had improved sanitation (according to MDG reporting standards) and 64.4% had flushing toilets (1).

**SOLID WASTE**

According to 2006 estimates, Belize produced over 200,000 tons of solid waste annually from domestic households and commercial establishments; per capita solid waste generation was 2 to 3 pounds per day (6). Roughly 50% of households did not have municipal refuse collection service, and almost 30% of refuse was burned, increasing the risk of vector-borne (e.g., dengue) and respiratory (e.g., asthma) diseases (1).

**THE WORK ENVIRONMENT AND WORKERS’ HEALTH**

Data collected by the Social Security Board (SSB) through employment-related injury claims revealed that 2,529 claims were filed in 2006 and 2,471 in 2007. Over the same period, the number of benefit days paid increased from 45,717 to 57,088, however, with construction and agriculture having the highest paid benefit days (7). The SSB was the only government agency that administered employment injury insurance during the reporting period, covering formal workers from the public and private sectors. Strategic Objective 4 of the Belize Health Workforce Strategic Plan 2010–2014 (8) aims to provide safer work environments for the country’s most vulnerable groups.

**ROAD SAFETY**

According to official government statistics, road traffic accidents were the sixth leading cause of death among all age groups in 2006, and the eighth and fifth leading causes in 2007 and 2008, respectively.

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1. Belize defines poverty as a lack of well-being due to insecurity, vulnerability, inequality, and unmet needs. Households in extreme, or severe, poverty are those whose expenditure falls below the minimum cost of a food basket needed to provide a healthy diet for an adult male.
In 2006 and 2007, males accounted for 75.8% and 79.4% of road traffic-related fatalities, respectively.

In 2006, 66.7% and in 2007, 65.1% of the deceased were wage earners, that is, they were engaged in remunerative activity (9). In 2006, mestizos were involved in 53.0% of all road traffic accidents, while in 2007, Creole and Garifuna persons were involved in 44.4% of such accidents. In 2006 and 2007, most road traffic-related fatalities (62.1% and 76.2%, respectively) occurred in Belize City. Overall, road traffic accidents occurred most frequently among persons in the 15–29-year-old (30.0%) and 45–59-year-old (23.8%) age groups.

Data for 2007 estimated the direct cost of road traffic accidents at US$ 245,775 (9).

**Violence**

The number of homicides increased from 103 in 2008 to 132 in 2010, representing a 29.0% increase in that period (10). In fact, in 2010 homicides hit a record high, with a rate of 40 per 100,000 population. In 2006 and 2009, there were 1,622 and 2,161 cases of domestic violence reported, respectively. Females accounted for 90.7% of these victims in 2006 and for 85.2% in 2009. Most female victims of domestic violence were in the 20–39-year-old age group, accounting for 76.6% of victims in 2006 and 68.4% in 2009 (11).

**Disasters**

The last hurricane to hit Belize was Richard, in 2010. The storm affected approximately two-thirds of the population; damages were estimated at US$ 24.6 million—US$ 7.3 million in damaged or lost homes and US$ 17.3 million in agricultural losses (12). The projected cost of Hurricane Dean in 2007 was US$ 89.5 million. In 2008, tropical storm Arthur caused significant flooding in Belize, especially in the south, and resulted in five deaths. In 2010, Belize became the first Caribbean country to develop a mental health response plan for disasters.

**Climate Change**

The effects of climate change threatened the country’s most important economic sectors, including agriculture, fisheries, energy, and tourism. A study conducted in 2008 assessed the impact of climate change on health, specifically in terms of dengue, which is endemic in the country. The study concluded that projected climate variability, such as drought, protracted rainy seasons, and rising temperatures, will exacerbate the potential for major outbreaks of dengue and dengue hemorrhagic fever (13).

**Food and Nutritional Security**

Although food caloric consumption was 2,846, exceeding the recommended population goal (RPG) of 2,250 calories, high levels of poverty and income inequalities prevented the most vulnerable populations from reaching this goal. Belize remained far behind in its effort to attain MDG 1 (reduce by half the number of people suffering from hunger) (4).

**Health Conditions and Trends**

**Health Problems of Specific Population Groups**

**Maternal and Reproductive Health**

In 2006, 2008, and 2009, Belize’s maternal mortality ratio was 85.3 per 100,000 live births (six deaths), 42.5 per 100,000 (three deaths), and 53.9 per 100,000 (four deaths), respectively. However, the maternal mortality ratio has declined significantly from its level in 2005 (134.1 per 100,000 live births) (4). Practically all of the maternal deaths were from obstetric causes such as eclampsia and postpartum hemorrhage (14).

**Infants (under 1 year old)**

Immunization coverage from 2006–2010 averaged 96% for BCG, DPT, OPV, and MMR. In 2006, 2007, and 2008, there were 100, 77, and 140
stillbirths, respectively (14). In 2006, 76.9% of births occurred in a hospital; by 2009, this figure had climbed to 90.6%. In 2006, there were 1,015 low-birthweight babies (under 2,500 g), decreasing to 653 in 2009 (15). Belize will not be able to reduce mortality in children under 5 years to 5.9 per 1,000 live births, which means that it is not on target to achieve MDG 4’s target (reduce by two-thirds, between 1990 and 2015, the under-5 mortality rate) (4). In 2006 and 2007, the leading cause of hospitalization for infants under 1 year of age was acute respiratory infections (ARIs), which averaged 27.0% of all causes. However, in 2008 and 2009, the leading cause was “other conditions originating in the perinatal period,” for an average of 21.5% of all causes. Congenital anomalies (15.6%) were the leading cause of death in 2006.² Hypoxia, birth asphyxia, and other respiratory conditions were the leading causes of death, accounting for 27.3%, 21.2%, and 21.1% of deaths, for 2007, 2008, and 2009, respectively. Other conditions originating in the perinatal period also accounted for 21.1% of deaths in 2009. Since the country had only one pathologist, not all infant deaths were autopsied. In 2006–2009, males accounted for 55.2% of deaths in this age group (11). The infant mortality rate in 2009 was 17.9 per 1,000 live births, representing a decrease from the 2006 rate of 19.7 but still above the Region’s rate of 15.6 (15). In 2008, 52.4% (3,703) of newborns at 1 month and 35.4% (2,501) of newborns at 4 months were exclusively breast-fed (11).

Children (1–9 years old)

In 2006–2007, the leading cause of hospitalization for children 1–4 years old was “bronchitis (chronic and unspecified), emphysema, and asthma,” accounting for an average of 13.6% of hospitalizations. In 2008, it was intestinal infectious diseases (12.4%) and in 2009 it was injury, poisoning, and certain other consequences of external causes (13.1% and 19.3%, respectively). In 2006 and 2008, the leading cause of death among children in this age group was accidents caused by fire and flame (28.6% and 22.2%, respectively); in 2007 it was diseases of the nervous system other than meningitis (27.3%); and in 2009, the leading causes were traffic accidents and accidents caused by fire and flame (22.2% each) (11).

Adolescents (10–19 years old)

Among 10–14-year-olds, appendicitis, hernias of the abdominal cavity, and intestinal obstructions were the leading causes of hospitalization (11.2%) in 2006; in 2007, they were complications of pregnancy, childbirth, and the puerperium (9.7%); and in 2008 and 2009, they were injury, poisoning, and certain other consequences of external causes (12.5% and 17.1%, respectively). Of the 6,977 live births to 15–19-year-olds between 2006 and 2009, adolescents under 15 years of age accounted for 24.8% (3,703). In 2009, the leading causes were traffic accidents and accidents caused by fire and flame (22.2% each) (11). The under-5 mortality rate was 24.8 per 1,000 live births in 2006 and 22.6 in 2009.

² Signs, symptoms, and ill-defined conditions and residuals and other causes were not included among the causes of death.
age group, there were no new cases of AIDS in 2006; however, there were 3 AIDS cases (all female) between 2007 and 2009.

Between 2006 and 2009, the leading cause of hospitalization among 15–19-year-olds was complications of pregnancy, childbirth, and the puerperium, averaging 72.5% of deaths per year. Of the total number of live births between 2006 and 2009, approximately 24.3% were to females in the 15–19 years age group. The leading causes of death in both 2006 and 2009 were homicide and injuries purposely inflicted by others (24.2% and 22.2%, respectively); traffic accidents were the leading cause in 2007 and 2008 (22.2% and 14.3%, respectively). There were seven HIV/AIDS cases (three females and four males) in this cohort between 2006 and 2009 (11).

Adults (20–49 years old)

The leading cause of death for the 20–29-year-old cohort in 2006–2008 was “injury, undetermined, whether accidentally or purposely inflicted,” for an average of 26.0% for those years; in 2009, it was “homicide and injury purposely inflicted by other persons” (29.8%). Among 30–39-year-olds, the leading cause of death was HIV/AIDS in 2006 and 2007 (24.5% and 17.7%, respectively), “injury, undetermined, whether accidentally or purposely inflicted” in 2008 (15.8%), and HIV/AIDS in 2009 (23.3%). Between 2006 and 2009, the leading cause of death among the population 40–49 years old was HIV/AIDS, accounting for an average of 17.2% of deaths in this group during those years. Among 50–59-year-olds, the leading cause of death was diabetes mellitus, accounting for an average of 14.9% of deaths in the period 2006–2009 (11).

The Elderly (60 years old and older)

The population age 60 and older increased from 4.7% of the general population in 2006 to 7.1% in 2009 (male-female ratio was 1.00:0.92). Between 2006 and 2009, the leading cause of hospitalization for this age group was diabetes mellitus. The leading cause of death in this age group was diabetes mellitus in 2006 and 2008, and ischemic heart disease in 2009 (11). Beginning in 2008, the country’s Non-Contributory Pension (NCP) fund provided US$ 50 (BZ$ 100) per month to elderly persons most in need through the Belize Social Security Board. In 2009, the number of NCP recipients totaled 4,297 (64.9% female and 35.1% male), representing 18.1% of persons in this age group. In 2010, only 37.3% of older persons received their medications free of charge; however, such medication represented out-of-pocket expenses for 61.0% of the elderly. One study also showed that older persons with limited incomes spent significant sums on prescription drugs, thereby compromising their ability to purchase other goods and services (14).

The Family

Household poverty levels increased from 24.5% in 2002 to 31.0% in 2009 (2). In 2006, 18.2% of children lived with a single mother, although the father was living; males headed 73.3% of households; and 5.1% of children under age 18 years old had at least one deceased parent. In 2009, the highest level of overcrowding among rural households was in Toledo (60%), far above the national average (13%). The 2006 Multiple Indicator Cluster Survey (3) indicated that 31.2% of the population had unmet needs for family planning services that year. Unmet family planning needs were greatest among 15–19-year-old women (45.4%). Among ethnicities, the greatest unmet needs for these services were among the Garifuna (34.3%) (3).

Mortality

Between 2006 and 2008, the mortality rate from all causes was 5.5 per 1,000 population. During this same period, mortality from communicable diseases was 84.2 per 100,000 population, which was significantly higher than the Region’s overall rate of 49.0—with males having a higher mortality rate (107.4) from these diseases than females (61.8). Between 2006 and 2008, underreporting of deaths was estimated at
19.2%, representing a significant increase from the 12.8% estimated in 2005 (16). An estimated 8.5% of all deaths between 2006 and 2009 were attributed to diabetes, which was the leading cause of death throughout these years. This amounted to an 18% increase over the corresponding figure between 2001 and 2005. In 2009, the five leading causes of death for men were homicide and injury purposefully inflicted (8.8%), HIV/AIDS (8.0%), ischemic heart disease (7.0%), diabetes mellitus (5.6%), and cerebrovascular disease (5.5%). For females they were diabetes mellitus (13.6%), ischemic heart disease (8.7%), cerebrovascular disease (7.2%), diseases of pulmonary circulation and other forms of heart disease (6.5%), and acute respiratory infections (6.2%) (11). In 2010, approximately 62% of the 10 leading causes of death were attributed to noncommunicable diseases (14) (Table 2).

**Morbidity**

**Communicable Diseases**

**Vector-borne Diseases**

The main malaria vector in Belize was *Anopheles albimanus*, although other mosquito vectors were reported. Malaria cases decreased significantly between 2006 and 2010, dropping from 844 to 150. This dramatic decrease came about due to the Ministry of Health’s concerted efforts, such as increased surveillance, foci elimination, and case identification, in the main endemic areas. During 2006 and 2007, Stann Creek recorded approximately 50% of all the country’s malaria cases, with Toledo reporting a similar percentage in 2008–2009 (11). Belize was on track to halt the spread of malaria by 2015, thus attaining MDG 6 (combat HIV/AIDS, malaria, and other diseases) (4). In 2007, there were 137 laboratory-confirmed cases of dengue; such cases rose to 292 in 2009 (all four serotypes had circulated). Data for 2009 revealed that there were 87 clinically-confirmed cases of dengue hemorrhagic fever, and in 2010 that figure increased to 293 cases. The number of detected cases of Chagas’ disease through screening at the National Blood Bank increased from 13 in 2006 to 45 in 2010. There were 15 cases of Chagas’ disease in 2007, 23 in 2008, and 35 in 2009. Between 2006 and 2009, there were 35 cases of hepatitis B and 52 clinical cases of mumps. There were no cases of yellow fever, measles, tetanus, rubella, diphtheria, or pertussis in the reporting period (11).

### TABLE 2. Ten leading causes of death, Belize, 2006 and 2010.

<table>
<thead>
<tr>
<th>2006</th>
<th>Rank</th>
<th>%</th>
<th>2010</th>
<th>Rank</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>1</td>
<td>9.4</td>
<td>Diabetes</td>
<td>1</td>
<td>9.5</td>
</tr>
<tr>
<td>Hypertensive diseases</td>
<td>2</td>
<td>6.0</td>
<td>Ischemic heart disease</td>
<td>2</td>
<td>7.7</td>
</tr>
<tr>
<td>Diseases of pulmonary circulation and other forms of heart disease</td>
<td>3</td>
<td>5.7</td>
<td>Homicide and injury purposely inflicted</td>
<td>3</td>
<td>7.6</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>4</td>
<td>5.4</td>
<td>HIV/AIDS</td>
<td>4</td>
<td>6.7</td>
</tr>
<tr>
<td>Cardiovascular diseases</td>
<td>5</td>
<td>4.9</td>
<td>Cardiovascular diseases</td>
<td>5</td>
<td>5.3</td>
</tr>
<tr>
<td>Traffic accidents</td>
<td>6</td>
<td>4.9</td>
<td>Diseases of pulmonary circulation and other forms of heart disease</td>
<td>6</td>
<td>4.0</td>
</tr>
<tr>
<td>Ischemic heart disease</td>
<td>7</td>
<td>4.7</td>
<td>Other chronic pulmonary diseases</td>
<td>7</td>
<td>3.8</td>
</tr>
<tr>
<td>Acute respiratory infections</td>
<td>8</td>
<td>4.5</td>
<td>Acute respiratory infections</td>
<td>8</td>
<td>3.7</td>
</tr>
<tr>
<td>Injury undetermined whether accidentally or purposefully inflicted</td>
<td>9</td>
<td>3.6</td>
<td>Hypertensive diseases</td>
<td>9</td>
<td>3.4</td>
</tr>
<tr>
<td>Homicide and injury purposely inflicted</td>
<td>10</td>
<td>3.4</td>
<td>Traffic accidents</td>
<td>10</td>
<td>3.1</td>
</tr>
<tr>
<td>Total</td>
<td>55.9</td>
<td></td>
<td>Total</td>
<td>54.8</td>
<td></td>
</tr>
</tbody>
</table>
HIV/AIDS and Other Sexually-transmitted Infections

From 1986 to 2009, there were 5,045 reported cases of HIV and 963 deaths. In 2008, there were 425 HIV cases reported (201 males, 224 females) and 365 cases in 2009 (177 males, 186 females, and 2 unknown). In 2009, the prevalence of HIV infection was estimated to be 2.3%. Belize has the highest prevalence rate of HIV infection in Central America and the third highest in the Caribbean. There were 82 AIDS-related deaths (54 males, 28 females) in 2008, and 101 (67 males, 34 females) in 2009, representing a 23% increase. In 2009, HIV/AIDS was the third leading cause of death. In 2009, a total of 9,236 persons were tested for HIV, of whom 4.9% tested positive. Stann Creek had the highest rate of seropositivity (7.8%), followed by Belize District (4.3%). In 2009 and 2010, 90.0% and 93.2%, respectively, of pregnant women visiting prenatal clinics were tested for HIV. Of these, 39 and 53, respectively, tested positive. Data for 2010 indicated that there were 55 deliveries to women with HIV/AIDS; one newborn died and 54 received antiretroviral (ARV) therapy at the time of delivery. Between 2006 and 2009, there were 1,638 HIV cases, of which 3.4% (57) had TB and HIV co-infection (14). Between 2009 and 2010, there were 198 new patients receiving ARV, bringing the total number of persons receiving such therapy to 1,053 (523 males and 530 females) (14).

Emerging Diseases

There were no reported cases of cholera, severe acute respiratory syndrome (SARS), or avian/human influenza during the reporting period.

Chronic, Noncommunicable Diseases

Cardiovascular Diseases

Cardiovascular diseases were the fifth leading cause of death in 2006 and 2010. In 2010, there were 341 deaths from cardiovascular diseases, with males accounting for 53.3% and females 46.6%. That year, 71.6% of such deaths occurred among the population age 65 and older. In 2009, ischemic heart disease accounted for 7.7% of all deaths, representing a substantial increase over the 5.9% of deaths due to this cause in 2005 (11).

Malignant Neoplasms

Malignant neoplasms of the cervix uteri, unspecified, accounted for most neoplasm-related hospitalizations in 2006 (9.2%) and 2007 (7.2%). The majority of such hospital admissions in 2008 were due to malignant neoplasms of the lymphatic and hematopoietic tissue (7.8%) and to malignant neoplasms of the trachea, bronchus, and lung (10.3%) in 2009 (8). In 2007, cancers accounted for 21% of all non-communicable disease-related deaths, or 14.2% of all deaths (15). In 2006 and 2008, malignant neoplasms of the prostate were responsible for the highest percentage (17.0%) of neoplasm-related deaths, whereas malignant neoplasms of the digestive organs and peritoneum, excluding the stomach and colon, caused the most neoplasm-related deaths (17.7%) in 2007 and 2009 (7). From 2006 to 2008, the mortality rate from malignant neoplasms was 85.7 per 100,000 population, which was higher among males (95.5/100,000) than females (77.7/100,000) (16). With regard to all deaths due to malignant neoplasms in 2008/2009, cancer of the prostate...
among men and cancer of the cervix uteri, unspecified, among women were the leading causes. Deaths due to malignant neoplasms of the female breast are on the rise, with 8 deaths in 2006, 12 in 2008, and 14 in 2009 (11).

**Diabetes**

According to the 2009 Central American Diabetes Initiative (CAMDI) survey, an estimated 13.1% of Belize’s population had diabetes. Diabetes affected more women (17.6%) than men (8.3%) (17). With respect to all diabetes-related hospitalizations during 2006–2009, men accounted for 65.0% and women for 35.0%. Between 2005 and 2009, 3.1% of all hospitalizations were due to diabetes. Between 2006 and 2009, diabetes was the leading cause of death among persons between the ages of 50 and 59 (11).

**Hypertension**

Hypertensive disease ranked among the 10 leading causes of hospitalization between 2006 and 2009. Of particular note, it was the second leading cause of death in 2006, with more deaths among females (53) than males (31). Between 2007 and 2009, the number of deaths from hypertensive disease was roughly the same for both sexes. However, in 2009, the number of male deaths increased by approximately 74.0% (from 23 to 40) (11).

**Nutritional Diseases**

**Malnutrition**

The 2006 Multiple Indicator Cluster Survey data showed that 6.1% of children under age 5 were moderately underweight and around 18% of children suffered from stunted growth. In 2006, growth retardation was more apparent (approximately 50.0%) among children of Mayan descent, mainly concentrated in the Toledo District, suggesting that cultural and socioeconomic factors are playing a role (3). Deaths from nutritional deficiencies and anemias among children under 1 year of age rose from 2.1% in 2006 to 4.7% in 2008; among children in the 1–4-year-old age group the condition rose from 5.4% to 11.4% in those same years (16).

**Obesity**

In 2008, it was estimated that 71% of the population was overweight (65.4% of males and 76.6% of females). Of this group, 34.9% were considered obese (20.4% of males and 45.4% of females) (18). In 2006, people of mixed race, or mestizos, accounted for the highest percentage of overweight and obese persons (69.5%), while people of East Asian descent had the lowest prevalence (53.8%). The districts reporting the highest and lowest percentages of overweight and obese persons in 2006 were Corozal (77.6%) and Toledo (52.3%). In 2008, 1,150 children under 1 year and 1,190 children between 1 and 4 years were obese (17).

**Mental Disorders**

In 2006, schizophrenia (40%) and mood (affective) disorders (29%) were the most frequent diseases treated at Rockview Hospital (19); this trend continued between 2007 and 2009 and was replicated in the primary health care setting. The 50-bed Rockview Hospital closed in 2008, and its patients were transferred to Palm View Center. In 2008, there were 11 suicides (10 male, 1 female), 5 of which occurred in Corozal. In 2010, there were 9 suicides (7 males, 2 females), 4 of which occurred in Belize District (14).

**Other Health Problems**

**Oral Health**

Oral health services were not covered by SSB insurance or by the country’s National Health Insurance (NHI) program. The number of dentists remained constant over the reporting period, with 40 dentists, most of whom practiced in urban areas. Data
on use of public dental services during 2006–2009 revealed that oral care focused on dental extractions rather than preventive or restorative care (14).

Ocular Health

Due to the limited data available, the extent of ocular health problems in Belize was unknown. In 2008, the Belize Council for the Visually Impaired, a nongovernmental organization that operates ophthalmology services on behalf of the Ministry of Health, reported that there were 1,523 blind persons in the country, 80 of whom were school children. In 2008, there were 125 new patients being treated for diabetic retinopathy, which reflects the increased prevalence of diabetes in the population (20).

Risk and Protection Factors

Smoking

In 2008, the age-adjusted daily smoking rates were estimated to be 4.1% for both sexes; however, daily smoking prevalence was much higher among males (7.7%) than females (0.5%) (18). In a 2009 report, CAMDI indicated that 50.6% of self-reported smokers were between the ages of 20 and 39 years (17). In 2008, 7.7% of school-aged persons had reported smoking at least once in the 30 days prior to a survey on risk factors for diabetes, hypertension, and chronic disease (11.7% of males and 4.4% of females) (21).

Alcoholism

The limited data suggested that approximately one-third of the population consumes alcohol regularly (17). Alcohol consumption in Belize is estimated to be 8.6 liters of pure alcohol per person per year, suggesting a high level of alcohol consumption in the country (22). Data on alcohol consumption were not available by gender or ethnicity.

Illegal Drugs

According to the Presidential Determination on Major Illicit Drug Transit or Major Illicit Drug Producing Countries, issued by the White House in September 2011, Belize has been identified as one of the 22 major illicit drug transit or producing countries in the world. However, Belize does not have a centralized office that organizes, compiles, or coordinates illicit drug-related information.

HEALTH POLICIES, THE HEALTH SYSTEM, AND SOCIAL PROTECTION

Health Policies

In 2010, the Government launched a national development policy entitled “Horizon 2030,” which included a section dedicated to the health of the population. During the reporting period, the Government developed several short-term, health-related plans: the National Poverty Elimination Strategy and Action Plan 2007, the Health Agenda 2007–2011, the National Health Information System Strategic Plan 2010–2014, the Health Education and Health Promotion Strategy 2009–2010, and the Hospital-Based Services Plan 2009–2011. The Ministry of Health has a medium-term national strategic plan. In 2010, the UNDP-PAHO Joint Capacity Assessment Exercise in Belize, entitled “Aid Effectiveness,” recommended improvements in monitoring, evaluation, and long-term health planning. No fundamental cross-cutting initiatives were launched to enhance health sector reforms during the reporting period.

The Health System’s Performance

The National Health Insurance (NHI) program, which began operating in 2005, purchased defined primary care packages from both public and private facilities. Some of the services included in the package are physician visits; monitoring of patients with hypertension, diabetes mellitus, HIV/AIDS, and cancer; and minor surgeries as well as family planning and counseling. The package covered 35% of the population in the south side of Belize City and both southern districts of Stann Creek and Toledo.
A token co-payment was waived if deemed a barrier to access; the remaining 65% of the population was covered by the national public health system. The NHI was financed by employee social security contributions.

**Health Legislation**

Belize's Constitution does not consider access to health services as a right. The legal health framework in Belize dates from 1970, and is enshrined in two legislative acts: the Public Health Act and the Health Services and Institution Act and their subsidiary acts. Belize's Medical Act, which legislates the practice of medicine, has been under review since 2000.

**Health Expenditures and Financing**

In 2009, the Ministry of Health’s budget as a percentage of GDP was 3.3%.

Public health funds were allocated by the Ministry of Finance (see Table 3). The modest growth in per capita health allocation is partially explained by such factors as the free distribution of ARV therapies, the expansion of primary care networks, and increases in staff and services. Most of the Ministry of Health’s budget was allocated to health workers’ salaries and the referral hospital; for example, in 2009, Karl Heusner Memorial Hospital received 50% of the health budget (14).

Private expenditure on health as a percentage of the total health expenditure decreased from 33% in 2006 to 29% in 2010; however, out-of-pocket expenditures rose from 32% to 42% over the same period (23).

**Human Resource Development Policies**

Belize had a plan for human resources in health, but no policy in that regard. Development of such a policy remains a priority to be supported by the Belize Human Resources in Health Observatory and a national human resource in health information system.

**The Health Services**

The Ministry of Health’s network of services was comprised of four partially decentralized health regions (North, Central, West, and South). There were no defined service baskets at the district level. During the reporting period, the country had 6 hospitals, 8 polyclinics, 34 health centers, and 38 health posts. With respect to the country’s hospitals, three are regional and provide primary and secondary care services; the other three are community hospitals providing minimum secondary and primary health care. The Central Medical Laboratory is the country’s national referral laboratory and classified as “level-1,” according to standard biosafety requirements. Throughout the reporting period, women

<table>
<thead>
<tr>
<th>Year</th>
<th>Revised Ministry of Health budget (US$)</th>
<th>% of national budget (BZ$)</th>
<th>% of GDP</th>
<th>Per capita (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006r</td>
<td>30,546,450</td>
<td>9.2</td>
<td>2.5</td>
<td>114.42</td>
</tr>
<tr>
<td>2007r</td>
<td>37,406,959</td>
<td>10.7</td>
<td>2.9</td>
<td>138.73</td>
</tr>
<tr>
<td>2008</td>
<td>43,091,357</td>
<td>10.5</td>
<td>3.2</td>
<td>133.79</td>
</tr>
<tr>
<td>2009</td>
<td>45,269,251</td>
<td>10.6</td>
<td>3.3</td>
<td>135.61</td>
</tr>
</tbody>
</table>

Source: Reference (14).

r = revised.
used the health services more than men, suggesting the need for targeted services to address men’s health issues. Generally, rural residents accessed primary health care facilities more often than they did hospitals. Despite the National Health Insurance program’s stated aim of eliminating barriers to access for a range of health services, inequities persisted in remote communities, primarily due to distance- and transportation-related barriers. The private sector offered secondary and tertiary health services as well as diagnostic and imaging services (24).

**Pharmaceuticals and Health Technology**

As of 2010, there was no national drug policy or pharmacovigilance system. Drug quality and testing are referred to the Caribbean Drug Research and Testing Laboratory, where the turnaround time can be as long as several months. The country’s pharmacy and therapeutics committee reviews the national drug formulary every five years. Procurement and distribution activities were regulated by the Maximum Price Contract Committee. In 2006, US$ 4,118,280 was spent on pharmaceutical drugs in the public sector, compared to US$ 4,837,771 in 2010. Although there was no charge for pharmaceutical products at the point of service, the unavailability of certain drugs remained a barrier. Limited access to equipment and technology was a challenge due to budgetary constraints, a lack of preventive maintenance protocols, and a lack of trained personnel (14).

**KNOWLEDGE, TECHNOLOGY, INFORMATION, AND HUMAN RESOURCE MANAGEMENT**

**Scientific Production in Health**

Scientific research initiatives were not institutionalized. NGOs and international agencies usually initiate and fund research projects to meet their demand for information. Knowledge on the health situation of the population was gained through routine surveys and reports compiled by the National Health Information System. A web-based data collection system was launched in 2008 and contributed to the wealth of current data for the health sector.

**Human Resources**

In 2009, there were 39.7 health professionals per 10,000 population, thus achieving the targets established in the Toronto Call to Action initiative (24). Belize District had the highest ratio of health care providers (57.4 per 10,000 population), while the Cayo District had the lowest (25.7 per 10,000 population). Cuban volunteers, who comprised 3.5% of the health care workforce, were mainly located in rural areas. Table 4 shows the number of health professionals working in the country. With respect to human resources in health, the need was greatest for nurses, public health inspectors, physicians, and pharmacists. The University of Belize offers training programs for nurses, midwives, nurse practitioners, rural health nurses, pharmacists, medical laboratory technicians, public health officers, and social workers. Inasmuch as Belize has no medical school, access and support to study medicine was obtained outside the country. The current attrition rate for students in health training programs is 66%, and the annual pass rate for nurses on the certification examination is approximately 50%. The health-training program at the University of Belize is not accredited (25).

<table>
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<tr>
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<tbody>
<tr>
<td><strong>Human resources</strong></td>
</tr>
<tr>
<td>Nurses</td>
</tr>
<tr>
<td>Physicians</td>
</tr>
<tr>
<td>Pharmacists</td>
</tr>
<tr>
<td>Dentists</td>
</tr>
</tbody>
</table>

* Core Data: Human Resources for Health, Belize 2009.
HEALTH AND INTERNATIONAL COOPERATION

Increasingly, official development assistance in Belize has taken the form of technical cooperation. Table 5 shows the main sources and nature of external assistance. Other donors include the Inter-American Institute for Cooperation on Agriculture (IICA), the Pan Caribbean Partnership against HIV/AIDS (PANCAP), and several universities. The total aid received and relative contributions from each donor were difficult to assess, because no centralized mechanism tracked or monitored external technical and financial cooperation.

SYNTHESIS AND PROSPECTS

The Government, in partnership with internal and external agencies, continually sought out mechanisms to address the country’s social and economic challenges. While gains have been made in health (e.g., reaching and maintaining equitable high vaccine coverage countrywide, achieving the goal of malaria elimination, providing micronutrient supplementation to all children under age 5, and expanding the baby-friendly hospital approach to all the country’s main hospitals), the burden of noncommunicable diseases and violence between 2006 and 2009 threatened to erode these gains. In light of the high prevalence of noncommunicable diseases and their risk factors as well as the steady increase in acts of violence, a multisectoral approach that includes private sector involvement is essential. Owing to its rising poverty rate, Belize is unlikely to achieve MDG 1 (eradicate extreme poverty and hunger). Although a number of focused poverty alleviation interventions were carried out in the country’s poorest districts, health disparities persisted, particularly among the Mayan population. A key challenge is to accelerate efforts aimed at reducing


<table>
<thead>
<tr>
<th>Bilateral donors</th>
<th>Cooperation type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Brazil</strong></td>
<td>Milk bank project</td>
</tr>
<tr>
<td></td>
<td>Response to HIV/AIDS</td>
</tr>
<tr>
<td><strong>Mexico</strong></td>
<td>Public health laboratory; prenatal care; epidemiological surveillance; health services delivery (e.g., colposcopy, cervical cancer screening, and prenatal care) along the Belize-Mexico border</td>
</tr>
<tr>
<td><strong>Taiwan</strong></td>
<td>Training in emergency medicine; cancer treatment; infection control; radiology; acute pain management; health care management</td>
</tr>
<tr>
<td><strong>Japan (through the Japan International Cooperation Agency [JICA])</strong></td>
<td>Training in nursing management; nosocomial infection control and prevention; HIV/AIDS diagnosis; prevention control; and hospital administration</td>
</tr>
<tr>
<td><strong>Cuba</strong></td>
<td>Undergraduate medical training; provision of health personnel (115 Cuban medical brigade personnel are currently deployed in Belize)</td>
</tr>
<tr>
<td><strong>Nigeria</strong></td>
<td>Undergraduate medical training; provision of health personnel (22 Nigerian health workers are currently deployed in Belize)</td>
</tr>
<tr>
<td><strong>Venezuela</strong></td>
<td>Eye health (“Operation Miracle”)</td>
</tr>
</tbody>
</table>

Subregional donors

- **Central American Integration System (SICA):** Council of Ministers of Health of Central America and the Dominican Republic (COMISCA); Meeting of Health Ministers of the Central American Region and the Dominican Republic (RESCAD)
  - Subregional health projects geared towards strengthening the health surveillance system, human capacity building, and other health projects
- **Caribbean Community (CARICOM), Council for Human and Social Development (COHSOD)**
  - Accreditation for health-related professions
- **Institute of Nutrition of Central America and Panama (INCAP)**
  - Nutrition and food security/safety

*Source: Reference (27).
infant and child mortality so as to achieve MDG 4 (reduce under-5 mortality by two-thirds). In order to pursue equity and better health for all, the country’s health information system should be expanded to include systematic data collection for monitoring inequalities, especially among the country’s various ethnic groups and by gender. This system should also be reevaluated so to ensure statistical integrity, including data accuracy, comparability, coherence, completeness, and transparency. Focused interventions must be considered with a view to reducing the attrition rate of students (66%) in the health training programs and to increasing the pass rate (about 50%) of nurses on the certification examination. Efforts must be redoubled to comply with the commitment to fully implement the International Health Regulations (IHR) before the close of 2012.

REFERENCES