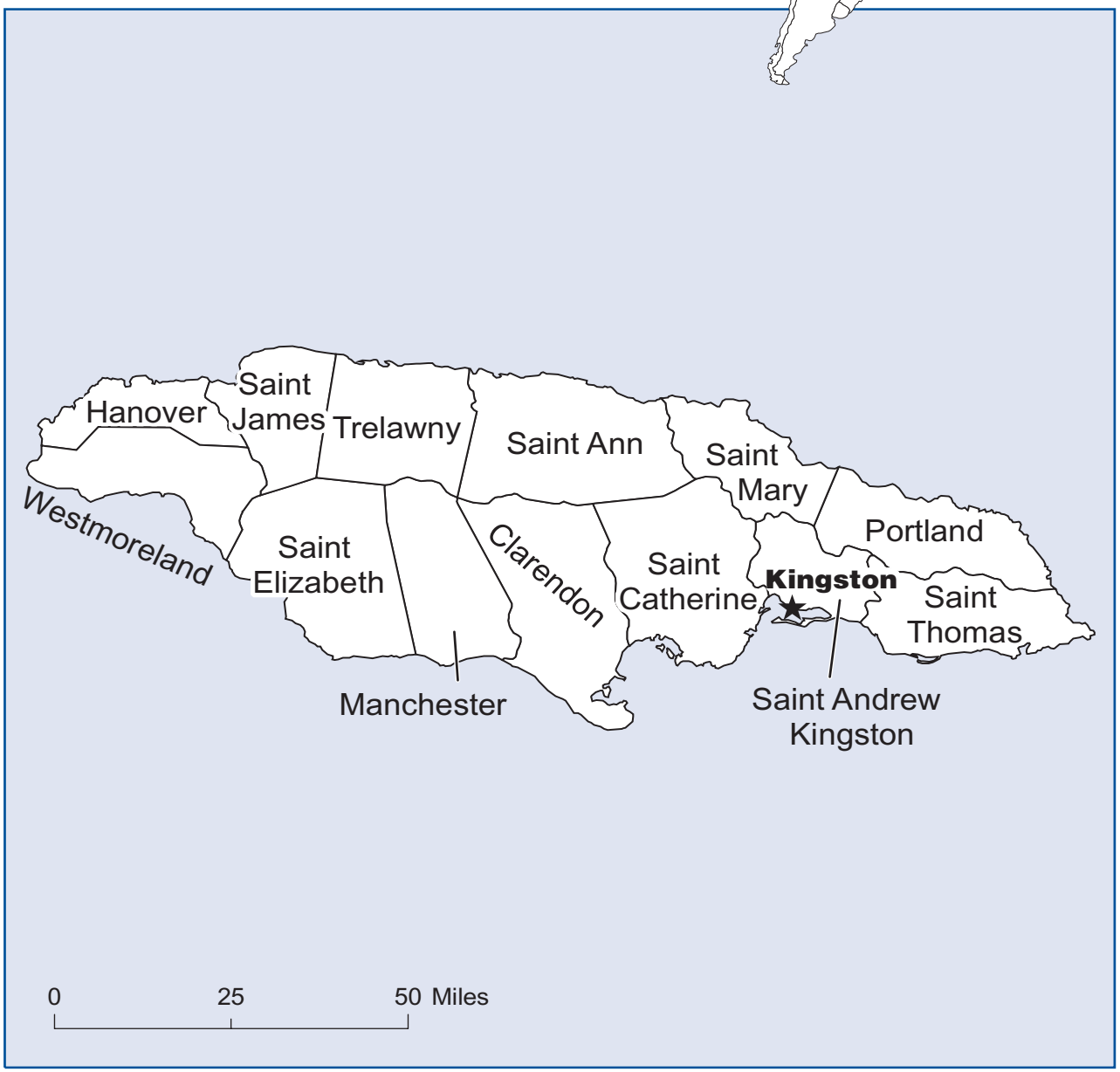
JAMAICA



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.

With a land area of 11,424 km^2, Jamaica is the largest English-speaking island in the Caribbean Sea. It is located 150 km south of Cuba and 160 km west of Haiti. The country is divided into 14 parishes. Its largest city is Kingston, the country's capital on the southeast coast. Other major population centers are Spanish Town, Portmore, and Montego Bay. Its estimated population in 2005 was 2,651,000.

GENERAL CONTEXT AND HEALTH DETERMINANTS

Social, Political, and Economic Determinants

Jamaica has been a stable constitutional democracy in the Commonwealth of Nations since its independence from Great Britain in 1962. Political governance is by a parliamentary system based on the Westminster/Whitehall model and a bicameral legislature. The Cabinet of Ministers forms the executive arm of the government and is headed by the Prime Minister.

The Jamaican economy reported its seventh consecutive year of real GDP growth (1.4%) during 2005 (*1*). The economy is heavily dependent upon services (71% of GDP) and continues to derive most of its foreign exchange from tourism, remittances, and bauxite-alumina. A study by the United Nations Environment Program (*2*), nonetheless, shows tourism "leakage" to be at 40% in Jamaica (i.e., the amount of tourism expenditure that remained in the country after taxes, profits, and wages paid outside the region are taken into account and imports are purchased). The economy faces serious long-term problems of high interest rates, increased foreign competition, a pressured exchange rate, a sizable merchandise trade deficit, large-scale unemployment, and a growing internal debt. Between June 2001 and September 2005, the exchange rate increased from J$ 45.7 = US$ 1 to J$ 62.5 = US$ 1. The government faced the difficult challenge of seeking to achieve fiscal discipline in order to maintain debt payments while simultaneously attacking a serious and growing crime problem that is hampering economic growth. Attempts by the government to control the budget deficit were derailed by Hurricane Ivan in September 2004, which resulted in damages costing an estimated US$ 599 million (*3*), while in 2005, a real GDP growth of 1.4% was achieved despite hurricanes Dennis and Emily, which caused damage to infrastructure and productive assets amounting to approximately US$ 96.9 million (*1*). Tropical storm Wilma in 2005 caused additional damages to agriculture, forestry, and fishing amounting to US$ 7.3 million.

According to the Jamaica Survey of Living Conditions conducted in 2003 by the Planning Institute of Jamaica (*4*), the poverty rate stood at 19.1%. The survey determined the poverty line to be J$ 63,717.17 per year for an individual and J$ 240,816.57 per year for a family of five. Incidence by region revealed higher levels of poverty in rural areas (24.2%), while other towns had the second-highest level at 15.8%, followed by the Kingston metropolitan area at 9.5%. According to a 2004 Millennium Development Goals (MDG) report prepared by the Planning Institute of Jamaica (*5*), half of the country's poor were children under age 18 and 10% were elderly. Two-thirds of all female-headed households were living at or below the poverty line. Despite lower poverty rates among the urban population, poverty was extreme in some inner-city areas.

The employment rate in 2005 was 63.9%, with a male participation rate of 72.9% and a female participation rate of 55.4%. The average unemployment rate for that year was 11.3%, down from 15.5% in 2000. Disaggregation by gender showed that the female unemployment rate (15.8%) continued to be more than twice that of males (7.6%) (*1*, *6*).

Literacy rates for the population 15 years and older in 2005 stood at 88.7% (85% for males and 92.3% for females). Jamaica achieved universal access to primary education (MDG 2) before the start of the last decade. The gross enrollment rate for 2004–2005 in public primary schools was 96% with an estimated 75.8% full attendance rate (*1*). Student enrollment in public secondary education for the same school year was 86.2%. Males have shown significantly lower levels of educational achievement than females, and this gap widens at the tertiary level (*7*). The higher educational achievements of females have led to increasingly higher numbers of women who are qualified and well placed to take advantage of economic opportunities (*8*). Despite higher unemployment rates among females in the general population, the number of women in Parliament increased by 50% between 1990 and 2004. Out of 14 Cabinet Ministers, in 2006 three were females, including the Prime Minister.

Jamaica's geographical proximity to both North and South America places the island in a strategic position as regards international drug markets and underground economic activity based on the trade of criminalized commodities (*9*). In 2004,

45.4% of the 4,240 deportations to the island (primarily from the United States, United Kingdom, and Canada) were due to drug-related offenses. Half of those deported were between 16 and 25 years of age (*6*). The number of deportees steadily increased from 2,529 in 2001 to 4,240 in 2004. Women are disproportionately used as drug couriers, and many end up incarcerated either in Jamaica or abroad.

Violence has reached epidemic proportions, with a homicide rate of 63 per 100,000 population in 2005, compared to 39.8 in 2002. The increase has affected all age groups. The homicide rate for males was approximately eight times that recorded for females, and in 2002 homicide was the leading cause of death for males. According to the Green Paper of the Ministry of Labour and Social Security (revised in 2006) (*10*), the high incidence of homicide and violence is attributable primarily to domestic violence, drug- and/or gang-related conflicts, reprisals and mob killing, political tribalism, and a breakdown in the social order.

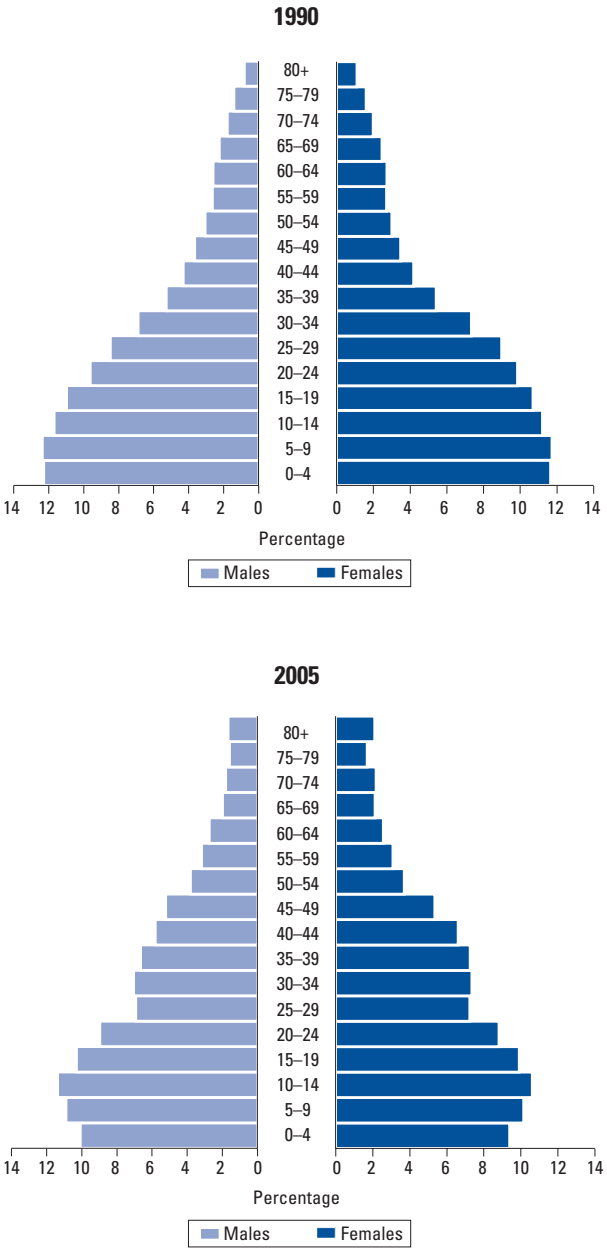
In 2004, 68.2% of the population had access to safe piped water on the premises, and 9.5% to safe water collected from standpipes (with 29.6% of this latter group having to walk a distance of more than 460 meters). The remaining 22.3% of the population received water from wells, rivers, or water distribution trucks (with 36.1% walking a distance of greater than 460 meters). With regards to sanitation, 21.9% of Jamaican households had toilet facilities connected to a sewer, 41.9% had a toilet not linked to a sewer, and 36.1% used pit latrines (*11*).

Demographics, Mortality, and Morbidity

Males comprise 49.3% and females 50.7% of the 2,651,000 total estimated 2005 population. The country's most recent census (2001) found that 52.0% of the population was urban, an increase of 2% over the previous census (1991) (*12*). The island is in an advanced stage of demographic transition, as reflected in a declining 0–14-year-old age group, and an increasing working age population (15–64 years old) and dependent elderly age group (65 years old and older). The country's population distribution by age and sex for 1990 and 2005 is presented in Figure 1.

High levels of emigration (17,900 in 2004) continue to impact on family life, as is evidenced by the phenomenon of the "barrel" children (i.e., those left to be raised on their own or by relatives); on the labor market (through the so-called "brain-drain," or emigration of well-educated, high-income, and qualified adults); on remittances (a major contributor to foreign exchange earnings); and on population structure (through low net rates of population growth). The age dependency ratio declined from 82.8% in 1982 to 73.9% in 1991, then to 73.1% in 2001 and 61.5% in 2004 (*13*); it is projected to continue declining over the coming years (*6*). The aging of the Jamaican population has implications for chronic disease prevalence and management, and utilization of health care services.

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



According to the 2005 Economic and Social Survey (*1*), life expectancy at birth was 73.3 years with the gap between males and females widening to 4.1 years (70.9 for males and 75.0 for females). Total fertility rates decreased from 2.8 in 1997 to 2.5 in 2002, and crude birth rates declined from 20.6 per 1,000 population in 2001 to 17.6 in 2004. Crude death rates showed a mild

fluctuation from 6.2 per 1,000 population in 2001 to 6.0 in 2004, and registered net out-migration remained high at 17,900 in 2004. The annual rate of population growth was 0.6% in 2001 and 0.5% in 2005.

Mortality rates, which are calculated from Vital Statistics Reports from the Registrar General's Department (RGD), are limited in their utility and interpretation due to difficulties associated with the registration process. A study by McCaw-Binns and colleagues (*14*) found that 89% of deaths registered in 1998 occurred in that year, 4% occurred in the previous year, and 6% occurred two or more years prior to being registered. Only 49% of fetal deaths and 64% of infant deaths were registered, compared to 96% of deaths in adults 60 years and over in 1998. In addition, 38% of deaths from external causes were not registered. Data from the Jamaica Constabulary Force for assaults and transport accidents and from the National Surveillance Unit of the Ministry of Health for HIV disease were substituted for registrations from the RGD in order to establish the leading causes of death (Table 1).

A number of distinctions appear when data are analyzed by gender. Malignant neoplasms, when aggregated, are the leading cause of death for both males and females, with the rate for males being 1.4 times higher than for females. When disaggregated by type of cancer, ranking for the 10 leading causes of death changes quite significantly, introducing prostate cancer for males with an increase from 29.3 per 100,000 population in 1999 to 40.5 in 2002, and cancer of the breast and cancer of the cervix uteri for females, with the latter pointing to insufficient efforts in screening. Cerebrovascular diseases rank first as a cause of death among females and second among males. The death rate for diabetes mellitus is 1.6 times higher for females than for males. Males are at a significantly greater risk of dying as a result of homicides and transport accidents than females. The homicide rate for males was approximately eight times the rate for females and homicide is the leading cause of death for males. Three-and-a-half times as many males as females die as a result of transport accidents.

TABLE 1. Ten leading causes of death, by rank, Jamaica, 2002.

Disease category	Total number	Rate per 100,000 population
Malignant neoplasms	2,686	102.3
Cerebrovascular diseases	1,905	72.6
Heart disease	1,774	67.6
Diabetes mellitus	1,477	56.3
Assault (homicide)[a]	1,045	39.8
HIV disease[b]	989	37.7
Hypertension	784	29.9
Acute respiratory infections	479	18.2
Chronic lower respiratory diseases	437	16.6
Transport accidents[a]	408	15.5

[a]Data from the Jamaica Constabulary Force substituted for registrations.

[b]Data from the Ministry of Health National Surveillance Unit substituted for registrations.

Source: Ministry of Health epidemiological profiles of selected diseases and conditions 2003 and 2005. Vital Statistics Report 2002, Registrar General's Department.

Chronic noncommunicable diseases accounted for half of the total reported annual deaths. The main risk factors as captured in the Jamaican Healthy Lifestyle Survey Report 2000 (*15*), based on a sample of 2,013 persons ages 15–74 years, were sedentarism in 42% of the population aged 40 and older, hypertension in 20%, overweight and obesity in 30% of men and 60% of women, and diabetes in 8% of the population 15–74 years of age.

The HIV/AIDS epidemic in Jamaica is classified as a generalized epidemic with an adult prevalence rate of 1.5% and a male-to-female ratio of 1.3:1. HIV death rates doubled for females between 1999 and 2002—15.8 per 100,000 population to 30.7—and increased from 26.9 per 100,000 population to 44.9 in males. The principal risk factors fueling the epidemic are unprotected sex, multiple sex partners, history of sexually transmitted infections (STIs), sex with sex workers, men having sex with men, and crack/cocaine use (*16*).

The epidemic poses a serious threat to the productive sector, since the majority of HIV/AIDS cases occur among the working and reproductive age group.

HEALTH OF POPULATION GROUPS

Children under 5 Years Old

In 2002, the infant mortality rate was estimated at 19.9 per 1,000 live births; this rate was maintained through 2004 and was approximately 4 deaths per 1,000 live births less than in 2000 (*17*).

Research by McCaw-Binns and colleagues (*17*) determined the neonatal mortality rate to be 15.3 per 1,000 live births and the post-neonatal death rate to be 4.6 per 1,000 live births. Perinatal death rates did not show any significant change and stood at 31.2 per 1,000 total births (live births + stillbirths) in 2005. The early neonatal death rate was 10.9 per 1,000 live births in 2004 and fetal deaths were 16.8 per 1,000 births in 2004. Both figures have shown little fluctuation during the period under review (Table 2).

Causes of infant mortality are presented in Table 3, where certain conditions originating in the perinatal period are shown to be the leading cause by a significant margin. The rate of low birthweight (< 2,500 g) stood at 10% in 2004, and this figure has remained stable during the period under review (*18*). Of the total number of births in 2004, 98.2% were hospital births. The number of mothers exclusively breast-feeding their children at 6 weeks of age declined from more than 60% in 2001 to 45% in 2004.

HIV disease was the leading cause of death in the 1–4-year-old age group in 2002 (Table 4). However, there have been fewer pediatric deaths from this cause since 2000, declining from 81 cases that year to 61 in 2004. This is attributable to improvements

TABLE 2. Perinatal, early neonatal, and fetal mortality rates, Jamaica, 2000–2004.

Year	Perinatal mortality rate[a]	Early neonatal mortality rate[b] per 1,000 live births	Fetal mortality rate[b] per 1,000 live births
2000	29.7	11.5	18.4
2001	31.0	12.4	18.8
2002	31.1	12.5	18.9
2003	29.5	11.7	18.0
2004	27.4	10.9	16.8

[a]Per 1,000 deliveries.
[b]Per 1,000 live births.
Source: Ministry of Health.

TABLE 3. Five leading causes of infant death, Jamaica, 2002.

Disease group	Total number	Rate per 100,000 population
Certain conditions originating in the perinatal period	335	73.8
Congenital malformations, deformations, and chromosomal abnormalities	51	11.2
HIV disease[a]	20	4.4
Acute respiratory infections	4	0.9
Malignant neoplasms	3	0.7

[a]Data from the Ministry of Health National Surveillance Unit substituted for registrations.
Source: Ministry of Health epidemiological profiles 2003 and 2005. Vital Statistics Report, Registrar General's Department.

TABLE 4. Five leading causes of death in children aged 1–4 years, Jamaica, 2002.

Disease group	Total number	Rate per 100,000 population
HIV disease	47	22.0
Congenital malformations, deformations, and chromosomal abnormalities	35	16.4
Land transport accidents	12	5.6
Malignant neoplasms	12	5.6
Acute respiratory infections	10	4.7

Source: Ministry of Health epidemiological profiles 2003 and 2005 from Registrar General's Department, National Surveillance Unit, and Jamaica Constabulary Force.

in the care and treatment of HIV-infected children and a decrease in mother-to-child transmission.

The gastroenteritis case fatality rate in the under-5 age group remains low (< 1%) but continues to be an important cause of morbidity. Respiratory diseases are the leading cause given in hospital discharge diagnoses for this age group, followed by injuries and infectious/parasitic diseases. Accidents and emergency (A&E) outpatient visits for asthma in this age group represent about 60% of all A&E asthma visits. Children under age 5 accounted for the majority of the burns and poisoning cases presenting to hospital A&E departments. The rate of undernutrition in children under age 3 has not changed and remains at approximately 3.4%, with severe malnutrition below 1%. According to Ministry of Health reports, the rate of obesity among children in this same age group is 6.7% (*19*).

Children 5–9 Years Old

Injuries and respiratory tract diseases, including asthma, were the main conditions affecting this age group in 2004. New cases of rheumatic fever continue to be reported every year: 112 cases were reported in 2005; of these, 4 were confirmed cases. The activities register for this disease counted 822 persons in 2004 (*18*). Completed reports are not available, but the coverage for secondary rheumatic fever prophylaxis stands at approximately 57%. This is of concern as the number of patients developing rheumatic heart disease is not declining. An estimated 120 or more children under the age of 18 years were orphaned by the loss of one or both parents to AIDS in 2003. The number of child abuse cases among the population ages 0–18 reported to the police increased from 346 in 2001 to 459 in 2004. The majority (90%) was due to carnal abuse (sexual assault) and affected principally females.

Adolescents 10–14 and 15–19 Years Old

One in every five Jamaicans is an adolescent. In general, this age group enjoys good health, accounting for only 2% of the deaths in 2003. Poor health, disability, and death among adolescents are usually related to high-risk behaviors. Intentional and unintentional injuries and reproductive health conditions (including HIV disease) are common among adolescents and are among the leading causes of death in this age group (Table 5).

The total fertility rate has been falling over the past decades, reaching 2.5 children per woman in 2002 (*20*). While birth rates have been falling and adolescent fertility rates reached 79 live births per 1,000 women aged 15–19 in 2002, the percentage of teenage pregnancies remains at 20%. One in every four girls aged 15–19 years is sexually active, and 12% of the female population aged 15–19 has had two or three pregnancies. Twelve percent of girls ages 15–19 who are sexually active report having been pregnant. Of those pregnancies, 30% did not end in a live birth (*21*). A 2002 study funded by the United Nations Population Fund (UNFPA) and the United Nations Children's Fund (UNICEF) indicated that abortion, despite its illegal status, was accessible to Jamaican adolescents (*22*). A 2005 study by UNFPA and the European Union on demand for emergency contraception among female adolescents between the ages of 15 and 30 (n = 1,524)

TABLE 5. Five leading causes of death in adolescents aged 10–19 years, Jamaica, 1999–2002.

Disease group	Total number	Rate per 100,000 population
Assault (homicide)	108	20.4
Unintentional injuries (transport accidents)	55	10.4
HIV disease	18	3.4
Malignant neoplasms	29	5.5
Heart disease	13	2.5

Source: Ministry of Health epidemiological profiles 2005 from Registrar General's Department, National Surveillance Unit, and Jamaica Constabulary Force.

showed that the 15–19-year-old age group is the one most frequently accessing abortions and the abortion incidence ratio in this age group was 21 per 100 pregnancies. Only 40% of the respondents indicated that they knew about the Emergency Oral Contraceptive (EOC), which was introduced as an over-the-counter drug in 2003. Access to the EOC was mainly through local pharmacies. The 2002–2003 Jamaica Reproductive Health Survey (*20*) indicated that condoms are the contraceptive method most widely used by adolescents aged 15–19 years. Contraceptive use at first intercourse in this age group was 76% for females and 44.9% for males. These contraceptives were obtained most frequently at shops or supermarkets, followed by pharmacies, according to respondents. Of the total postnatal clinic attendees accepting a family planning method in 2004, 20% were adolescents. The average age of sexual initiation was 15.8 for females and 13.5 for males. In the same survey, in 2002, 20% of the women between 15 and 19 years of age reported having been forced into sexual intercourse, compared to 25.9% in 1997. Females in the 10–19-year-old age group had a two-and-a-half times higher risk of HIV infection than males of the same age group in 2004. This difference may be related to social factors involving girls having sexual relations with HIV-infected older men. According to the Jamaican Healthy Lifestyle Survey Report 2000 (*15*), 11.6% of adolescents reported physical abuse, and 2.7% reported engaging in a fight with a weapon. Adolescents accounted for 26% of all persons with injuries from violent acts who were treated at the A&E departments of all hospitals.

Adults 20–59 Years Old

Visits to curative, family planning, STI, dental, casualty (emergency), and outpatient services, with a male-to-female ratio of approximately 1:2.3 for these visits, have allowed closer monitoring and earlier diagnosis of health conditions in women. In 2004, men accounted for 32.9% of visits made to primary care curative services and for 7.7% of visits made to family planning services. Reproductive health conditions are the main reason for women's contact with all levels of the health system. Other important health problems include STIs, diabetes, hypertension, and cancer. Women's reproductive health is monitored through a network of prenatal and postnatal clinics. According to Ministry of Health reports, in 2004, 58.9% of pregnant women made an average of 4.4 visits per pregnancy to prenatal clinics in government health centers (compared to 67% of women averaging 4.3 visits per pregnancy in 2000). Pregnant women are routinely screened for anemia, sickle cell, syphilis, and HIV. In 2005, testing of antenatal clients stood at 80.2% for syphilis and approximately 90% for HIV. The seropositive rate for syphilis was 1.3%, and for HIV it was 1.5%. However, the timeliness of screening and of the results' availability continues to be a problem, and thus treatment of positive cases was low (46.8% for syphilis and approximately 57% for HIV). There were 12 cases of congenital syphilis reported through the active hospital surveillance system in 2004. Testing of 80.9% of pregnant women revealed an anemia level (Hb < 10 g/dL) of 15.8%, similar to the 2001 level. Postnatal visits by mothers to clinics represented a coverage of 69.7% of the estimated births in 2005, a slight decrease compared to 2000 (73%). Of postnatal clinic attendees, 71.1% were recruited as family planning acceptors. Fifty-three percent of women aged 15–44 years interviewed in the Jamaica Reproductive Health Survey 2002–2003 (*20*) were current users of a contraceptive method. Condoms and the contraceptive pill have maintained their position as the two most frequently used methods, at 33.6% and 24.5%, respectively. Although 98.2% of babies are born in hospitals, the acute shortage of trained nurse midwives affected the quality of care given to women. Cesarean section rates remained fairly constant at approximately 14%. The maternal mortality ratio has remained unchanged over the past decade and stood at 94.8 per 100,000 live births for the 2001–2003 period (*17*). Direct obstetric deaths, although still responsible for most of the deaths, are declining, and indirect causes are increasing. Gestational hypertension remained the leading direct obstetric cause of maternal death, while HIV/AIDS was the leading cause of death of indirect obstetric mortality. The growing contribution of indirect causes, such as HIV/AIDS, cardiac disease, sickle cell disease, diabetes mellitus, and asthma, suggests the need for clinical guidelines and improved collaboration with medical teams to provide targeted care to women with chronic disease conditions who become pregnant (*17*).

Violence has been responsible in the last few years for a number of coincidental maternal deaths.

Maternal mortality surveillance has improved since the development in 2002 of regional committees, and as a result, 47 maternal deaths were investigated in 2005. This measure was undertaken as a way to improve preventive interventions and treatment and evaluate their results; at the same time, it provides input for future policy and program development.

Partographs were introduced in 2005 in all hospitals that perform deliveries. The Jamaica Reproductive Health Survey 2002–2003 (*20*) showed that 59% of women had had at least one Pap

smear in their lifetime, compared to only 50% in 1997. The survey (*20*) also found that 20% of women in the sample had at some point in their life been sexually assaulted by being forced into sexual intercourse. No difference was found between age groups or geographical location, and in most cases, the perpetrator was someone they knew.

HIV/AIDS and STIs are the second leading cause of death for both men and women in the 30–34-year-old age group in Jamaica. The rate of HIV infection is increasing more steadily among women than among men. One in four men and one in 10 women reported having had a sexually transmitted infection, and one in two men and two in 10 women reported having had more than one sexual partner in 2003. In addition, one in two persons reported not using a condom in their last sexual act (*15*).

Older Adults 60 Years Old and Older

Malignant neoplasms were the leading cause of death in this age group in 2002, followed by diseases of the circulatory system, heart diseases, diabetes mellitus, and hypertension. Communicable diseases, including HIV/AIDS, ranked sixth in the leading causes of death, indicating the growing importance of HIV/AIDS among the older population as a public health issue. The main causes of disability remain arthritis and visual impairment. The mental health issues of loneliness and social isolation have been identified as requiring special attention in the development of social policy approaches to healthy aging. As reported by the World Health Organization (WHO) Collaborating Center for the Aged (*23*), in 2003–2004 there were 263,000 persons (10%) over 60 years of age in Jamaica, and this figure is projected to double over the next two decades.

There is a feminization of aging, with more frail older females than males. Most of the population 60 years old and older is supported by families (65%) and the remainder by self-generated wages and other financial means. Pension coverage levels are low, as are levels of insurance coverage, while costs are high.

The Family

Of the 744,700 households identified by the 2001 census (*12*), 59% were headed by males and 41% by females. While 62% of male-headed households involved common law or married unions, only 27% of female-headed households fell into this category. Women also accounted for the greater proportion of large-sized households.

Persons with Disabilities

In the 2001 census (*12*), 6.2% of persons reported having a disability. Restricted activities were reported by 44.4% of this group. The five main disabilities reported were: visual impairment only (31%), physical disability (20%), hearing impairment only (9.8%), mental illness (9%), and multiple disabilities (6.3%). Of the 444,400 persons (17%) reporting a chronic illness, 15% indicated that they additionally had a disability which limited their activities.

Displaced Populations

In 2004, following political turmoil in Haiti, Haitians arrived by boat in successive waves, totaling 881 by 2005.

HEALTH CONDITIONS AND PROBLEMS

COMMUNICABLE DISEASES

Vector-borne Diseases

Monitoring of mosquitoes continues as an important initiative to control the *Culex*, *Aedes aegypti,* and *Anopheles* species. All **malaria** cases in the period under review were imported. In 2004, 141 cases were confirmed, and in 2005 there were 79 such cases. The majority of these were linked to the displaced Haitian population that began arriving in 2004. Special vector control interventions were devised to interrupt possible transmission of malaria and **filariasis**. There were 27 cases of **dengue fever**. The last dengue outbreak occurred in 2002, with 102 confirmed cases. The national *Aedes* Household Index remains well over 5% (range: 6.0%–45%). The 2004 indices for the country's two international airports, Montego Bay Sangsters and Kingston Norman Manley, were 4% and 0.75%, respectively (*24*).

Vaccine-preventable Diseases

In 2001 to 2005, no cases of **measles**, **polio**, **diphtheria**, **rubella**, **congenital rubella**, or **neonatal tetanus** were reported. There were 8 cases of suspected **pertussis** and 13 **non-neonatal tetanus** cases reported in 2005.

Preliminary results of a 2005 vaccination coverage survey revealed that 95% of the 12–23-month-old age group were adequately immunized, while by age 1, 89–90% were vaccinated. The immunization coverage at age 1 for 2005 by antigen using corrected target populations is: 94.5% for **tuberculosis** (TB); 83.6% for polio; 87.5% for diphtheria, pertussis, and tetanus; 88.6% for ***Haemophilus influenzae* type b** (Hib); and 87.2% for **hepatitis B**. Coverage for measles, mumps, and rubella for the 12–23-month-old age group is 84%. Hepatitis B and Hib vaccines were introduced as a combination pentavalent (DPT/HepB/Hib) vaccine in June 2003 (*25*). A comprehensive evaluation of the immunization program, together with the development of a five-year plan, took place in October 2003.

There were 307 laboratory-confirmed cases of hepatitis B in 2004. The number has increased over the last few years due to improved data collection.

Intestinal Infectious Diseases

No **cholera** cases have been reported in Jamaica for many decades. **Typhoid** is endemic, and three cases of typhoid fever were confirmed in 2005 and eight in 2004. There were outbreaks of **gastroenteritis** in 2003 and 2004; the case fatality rate remained at less than 1%.

Chronic Communicable Diseases

The national **tuberculosis** (TB) incidence rate in 2004 was 4.4 per 100,000 population, similar to the rate of 4.5 in 2000, but with an increase of case numbers in urban areas. Four pediatric cases were reported in 2004, compared to 17 in 2001; three of the four cases were HIV-coinfected. TB/HIV comorbidity increased from 14.2% in 2000 to 40% in 2003, but decreased to 27% in 2004. Coinfection rates were higher in urban areas compared to rural ones. Sixty-six percent of the 117 pulmonary-positive cases converted to sputum-negative in three months. Only 44% of the cohort of 117 successfully completed the course of treatment. The case fatality remains high at 22 per 100 sputum smear-positive cases. Drug compliance stood at 85% in 2000, but declined to 55% in 2004. A national assessment of the TB program carried out by the Pan American Health Organization (PAHO) in May 2005 concluded that despite the low incidence rate, TB is not under control, as evidenced by the high incidence in children, the high TB/HIV coinfection rate, and the high proportion of sputum smear-positive cases. The absence of sustained Directly Observed Therapy, Short Course (DOTS) was also deemed a constraining factor (*26*).

Ten new cases of **Hansen's disease** (leprosy) were confirmed in 2005, compared to eight in 2004. The prevalence rate was 0.05 per 10,000 population. Leprosy control is fully integrated in the primary health care services. Currently, 14 active cases are registered for chemotherapy; 13 of these cases are multibacillary, which highlights the infectious reservoir in the local population. At the end of 2004, 54 cases were registered for surveillance (*27*).

In 2005, 15,917 newborns, or approximately 30% of all live births, were screened for **sickle cell**. Of these, 118, or 0.8%, had an electrophoretic pattern suggestive of hemoglobin SS, SC, or CC disease. The Sickle Cell Unit at the University of the West Indies (UWI) offers counseling, education, and health maintenance checks. It also operates an ambulatory clinic and a day care ward where complications such as acute painful crises, acute febrile illness, and acute anemia are managed. Over 90% of patients with acute painful crises are managed as outpatients, and this model of aggressive acute day care has served as a model for sickle cell disease treatment centers elsewhere. Outreach clinics for health maintenance checks are also conducted in two other regions of the country. At last estimates, the median survival for sickle cell patients in Jamaica was 53 years for men and 58.5 years for women (*28*).

Pulmonary Infections

Respiratory tract diseases (RTDs), including **asthma**, accounted for 17% of total curative visits in 2002, highlighting the importance of this health condition. The number of visits for RTDs increased from 79,000 in 1990 to 108,000 in 2002. Asthma accounted for half of the visits to A&E departments in 2002. A weekly pulmonary clinic began operating at the national pediatric hospital (Bustamante Children's Hospital) in 2000 and drastically reduced RTD morbidity and hospitalizations in 85% of the children who attended the clinic for at least one year (0–1 outpatient visits, compared to 5–22 visits prior to 2000). Asthma protocols have been developed and training organized in all parishes. **Bronchitis**, **emphysema**, and other obstructive pulmonary diseases accounted for 11% of RTD discharge diagnoses in males and 6% in females.

HIV/AIDS and Other Sexually Transmitted Infections

According to Ministry of Health reports, an estimated 22,000 adults in Jamaica were living with HIV in 2004. The AIDS incidence rate in 2005 was 505.13 per 1 million population. Of the estimated 8,000 children and adults in need of antiretroviral treatment, only some 1,500, or 19%, were receiving it at the end of 2005 (*29*). Despite the initiation of a plateau in the annual number of mortality cases, the introduction of antiretroviral therapy, and other advances in care and treatment strategies, HIV/AIDS remains a growing public health concern in Jamaica.

Knowledge regarding HIV/AIDS and its routes of transmission is high in Jamaica (*30*). Despite this fact, 24% of men and 34% of women having sex with a non-regular partner do not use a condom (*31*). The Ministry of Health estimates that 65% of those infected with HIV in Jamaica are unaware of their status. In 2003, the Ministry of Health established voluntary counseling and testing (VCT) sites at all major health centers and antenatal clinics. Approximately 90% of antenatal clinic attendees and over 50% of STI clinic attendees were receiving VCT services in 2006 (*32*).

A Jamaican Ministry of Health estimate in 2002 indicated that 19.4% of all HIV/AIDS cases were linked to sex work. A 2005 behavioral surveillance survey on HIV and female sex workers found stark differences between HIV-positive and -negative female sex workers. Those who were HIV-positive generally were found to be older, have fewer years of education, earn significantly less money per client, and be more likely to be street-based than those who tested negative for HIV. Additionally, the HIV-positive female sex workers reported having taken in significantly more regular paying partners in the seven days prior to the survey interview and reported significantly less condom use at last sex, particularly with local (Jamaican) clients. This group was also twice as likely to report no condom use at last sex with a non-paying partner (*33*).

The prevalence of STIs varies significantly by age and sex. A 2004 study on knowledge, attitudes, practices, and beliefs found

that 34.3% of males ages 25–49 reported having an STI compared to 15.0% of females in the same age group. In the 15–24 age group, the figure was 9.8% for males and 8.2% for females (*34*).

Zoonoses

There was a sharp increase in the number of reported **leptospirosis** cases in 2005 following heavy rains during the hurricane season. Of the 921 suspected cases, 328 were confirmed. Zoonoses surveillance continued for the following diseases: leptospirosis, **bovine brucellosis**, **bovine tuberculosis**, **West Nile virus**, **bovine spongiform encephalopathy**, and ***Salmonella enteritidis*** contamination.

NONCOMMUNICABLE DISEASES

Metabolic and Nutritional Diseases

Diabetes mellitus is an important cause of morbidity and mortality in Jamaica and represents a significant burden on health services. The average length of stay was 8.3 days for diabetes in 2002, compared to 6.3 days for all conditions. In the Jamaican Healthy Lifestyle Survey Report 2000 (*15*), diabetes was found in 6.3% of males and 8.2% of females. There was a sharp increase with age. Awareness of diabetes among those classified as diabetic by the survey was 76.3%. Almost one-third of those classified as diabetic were not being treated, and 60% of those who reported being on medication did not have their condition controlled.

Cardiovascular Diseases

Hypertension and other diseases of the circulatory system remain an important cause of morbidity and mortality and create a major burden on health care services. Primary health care curative visits for diabetes and hypertension in 2002 represented 25.9% of all curative visits to government health centers, with a male-to-female ratio of 1:4.

In 2002, diseases of the circulatory system accounted for 7.7% of all government hospital discharge diagnoses, compared to 5.9% in the previous decade. This was the third leading cause of morbidity among hospital discharge diagnoses in 2002. The male-to-female ratio was 1:1.2 among these patients. The average length of stay for treatment of cardiovascular diseases was 8.7 days, compared to the 2002 average for all diseases of 6.9 days. Circulatory system diseases accounted for the third leading proportion of hospital care costs in all four of the country's health regions in 2002 (*35*). The Jamaican Healthy Lifestyle Survey Report 2000 (*15*) noted a prevalence of hypertension of 19.9% among males and 21.7% among females; prevalence increased with age in both rural and urban populations and in both sexes. Among persons known to be hypertensive, 42% were on treatment, and of this group, 37.7% had been able to lower and maintain their blood pressure at 140/90 or less.

Malignant Neoplasms

In 2002 there were 3,769 public hospital discharge diagnoses (4% of total discharge diagnoses) for malignant neoplasms with an equal gender distribution. The types of neoplasms involved for males, in order of decreasing frequency, were: trachea, bronchus, and lungs; prostate; leukemia; and non-Hodgkin's lymphoma, representing 56% of all cancers. For females, the order was as follows: breast; cervix uteri; other malignant neoplasms of female genital organs; trachea, bronchus, and lungs; leukemia; and non-Hodgkin's lymphoma, together representing 56% of all cancers. The Cancer Registry operates out of UWI and collects data mainly from the Kingston-Saint Andrew region. A 2003 study (*36*) found that gynecological cancers in this region represented 26.8% of all types of cancers found among females there. Cervical cancer accounted for 62% of these gynecological cancers, with an incidence of 27.9 per 100,000 women and a mortality rate of 15.8%.

OTHER HEALTH PROBLEMS OR ISSUES

Natural Disasters

Jamaica is vulnerable to a variety of natural hazards (hurricanes, floods, draughts, landslides, and earthquakes), and current efforts are concentrated on vulnerability reduction. This paradigm shift from preparedness to risk reduction is being achieved through staff training in new risk reduction concepts and the use of technology available to minimize such risks. Vulnerabilities were exposed during the recent experiences with hurricanes Charlie (2004), Ivan (2004), Dennis (2005), and Emily (2005), with economic losses reaching millions of US dollars.

Violence and Other External Causes

Jamaica has experienced an alarming upward spiralling of its crime rate, with homicides moving from a low of less than 200 per annum in the early 1970s to 1,674 in 2005, or 63 per 100,000 population. The increase has affected both sexes and all age groups, but particularly children, the elderly, and women. The Economic and Social Survey of 2005 (*1*) reported 1,292 major crimes committed against children between ages 0 and 19 years; of these, 573 were committed against children 14 years of age and under. Major crimes, including homicide shootings, rape, sexual offenses, and robbery, were committed by 53 children ages 12–14 years in 2005 (compared to 25 in 2003). In 2005, 188 women lost their lives in crime-related events, compared to 109 in 2001. Homicides against children (ages 0–20) increased from 145 cases in 2001 to 172 (ages 0–19) in 2005.

When obstetrics are excluded, injuries remained the leading hospital discharge diagnosis for the 1999–2002 period, representing 11% of all discharge diagnoses. When disaggregated by age group, injuries were in the top three leading causes given in discharge diagnoses in the 1–4-, 5–14-, 15–25-, and 26–44-year-

old age groups, highlighting the impact of this condition on hospital services. Data from the Jamaican Injury Surveillance System, which is based in hospital A&E units, revealed that males accounted for 59% of outpatient visits in 2005. Fights/arguments were responsible for 76.4% of the cases. The major weapons used to inflict injury included blunt objects (40%), sharp objects (35%), and firearms (7%); injuries involving the last category increased 3.1% over the previous year.

The cost burden due to intentional and unintentional injuries has continued to grow, resulting in expenditures of US$ 11.3 million in 1996, US$ 21.3 million in 1999, and US$ 22.6 million in 2002. Nearly half of this last figure was concentrated in the South East Region (including Kingston). It is estimated that up to half of the total injury costs resulted from intentional injuries. In order to attend to those requiring immediate care for their injuries, health personnel had to curtail other types of non-emergency services previously scheduled; delays were also caused for emergency patients whose injuries were less serious.

A total of 1,846 persons were killed in motor vehicle accidents during the 2001–2005 period. The largest group of fatalities was among pedestrians, followed by private automobile passengers, private automobile drivers, and bicyclists and motorcyclists. In 2004, 14,046 persons utilized the A&E departments for injuries resulting from road traffic collisions, representing a 20% increase over 2000 figures.

The health care cost for road traffic accidents in 2005 was estimated to be US$ 8.8 million. That year, 10,339 road collisions resulted in 326 fatalities, with male drivers accounting for 81% of these collisions. An island-wide study on knowledge, attitudes, practices, and beliefs was conducted among 500 male drivers in 2005. Preliminary results indicated that 12% of the respondents bypassed the official driving test. One-third of the respondents reported having had at least one road traffic collision since receiving their driver's license. Among those who were involved in a major collision, 16.7% of the 18–29 age group admitted to having had two or more major collisions; this number rose to 36.9% for the group 60 years of age or older, suggesting a pattern of repeat collisions. Half of the interviewees admitted to disobeying speed limits, 42% said that they did not always wear their seat belts, and 28% admitted to drinking and driving.

Morbidity data revealed that in 2004 the major diagnoses in clients seen in public community mental health clinics were schizophrenia/psychotic disorder (59.1%), mood disorders (26.7%), substance abuse (6.1%), disorders of childhood and adolescence (4.3%), and anxiety disorders (3.8%). With respect to mental health clinics, gender analysis showed that 60% of the clients diagnosed with schizophrenia and 95% of those diagnosed with substance abuse were males, while 71% of those suffering from mood disorders were females. A year-long study was carried out during 2005 at two major hospitals on 147 cases of attempted suicide. Two-thirds of the cases were females with a mean age of 28 years, even though a significant number of the cases were from the 15–19 age group. Drug overdose was the method of choice.

According to the Jamaican Healthy Lifestyle Survey Report 2000 (*15*), current cigarette smoking was reported by 29% of men and 8% of women, while 25% of the men and 4% of the women said they smoked marijuana.

Environmental Problems

In 2003, there were 1,127 clients seeking care for poisoning at the A&E outpatient departments of public hospitals. The under-5 age group remained the largest group affected, representing 54.3% of the cases. This trend has remained unchanged over the years. The most common poisons are bleach, kerosene, and pesticides. Eleven cases of lead poisoning in children were reported during the review period; seven of the cases were possibly linked to soil contamination through improper disposal of battery components.

Diseases Transmitted through Blood

All collected blood units are tested for the following infection markers: HIV, human T-cell lymphotropic virus type 1 (HTLV), hepatitis C surface antigen (HBsAg), hepatitis C virus (HCV), and syphilis. The positivity rate (%) in 2005 was 2.3 for syphilis, 1.59 for HTLV, 0.6 for HBsAg, 0.47 for HIV, and 0.43 for HCV. All markers showed a declining trend, with the exception of HCV (+0.13) and syphilis (+0.4).

RESPONSE OF THE HEALTH SECTOR

Health Policies and Plans

Jamaica is party to all of the international human rights conventions that recognize health as a human right. During 2004, the Ministry of Health focused on the three Millennium Development Goals whose scope of activity calls for a direct role by the health sector: MDG 4 (reduce child mortality), MDG 5 (improve maternal health), and MDG 6 (combat HIV/AIDS, malaria, and tuberculosis). A national report prepared by the Planning Institute of Jamaica noted that according to U.N. targets, Jamaica is "far behind" in achieving the child mortality reduction and maternal health goals and is "lagging" in relation to the target for HIV/AIDS, indicating that overall, insufficient progress was made during the 1990s to be able to attain the target values by 2015 (*5*). The government's commitment to achievement of the MDGs is to be bolstered by specific policy measures adopted during the period of the Medium-Term Social and Economic Policy Framework (MTSEPF). The MTSEPF 2004–2007 is buttressed on the two pillars of poverty reduction and economic growth, and its section on health issues focuses on strategies to achieve MDGs 4, 5, and 6.

The Ministry of Health's National Health Policy (2006–2015) and accompanying strategic plan for the 2006–2010 period take

into consideration the gaps and strengths identified in the previous plan's evaluation. The indicators are outcome-oriented, and the 2006–2015 priorities are selected based on national needs and the island's disease burden and take into account MDG 8, which focuses on the creation of global partnerships for development. Through these health inputs and the forging of strong partnerships, the National Health Policy seeks to maintain the gains of previous years, regain lost ground for some indicators, move ahead in decreasing the major threats to population health—such as HIV/AIDS and other lifestyle diseases—and improve some of the development indicators.

The HIV/AIDS National Strategic Plan 2002–2006 outlined the policy framework for Jamaica's response to the global pandemic. In May 2005, the National HIV/AIDS Policy was officially launched; it incorporates a human rights approach in the multisectoral response to HIV. In 2003, the Cabinet mandated five key public sector ministries to prepare and implement HIV/AIDS work programs within their respective sectors and to report regularly to the Cabinet on progress. In 2005, the number of ministries involved expanded to 11, thereby involving all government ministries in integrating HIV/AIDS issues into their operations at the appropriate levels (*1*).

During the 2001–2005 period, legislation was introduced and/or amended to promote and protect the rights of children (The Child Care and Protection Act), to provide enhanced protection for victims of domestic violence and abuse (The Domestic Violence Amendment Act), and to safeguard the property rights of women and men in the event of a breakdown in a marriage or union lasting longer than five years (The Property Rights of Spouse Act). Other achievements of note taking place during the study period include the National Framework of Action for Children (2004), a national policy on children, a national youth policy, and the Early Childhood Act.

Progress also was made in phasing in implementation of the National Policy for Senior Citizens, the drafting of the National Assistance Bill to replace the Poor Relief Act, and regarding the Disability Bill to strengthen implementation of the National Policy for Persons with Disabilities. The following environmental legislation was also introduced: the Water Policy and Implementation Plan; Regulations for the Management of Septage and Sludge; Hazardous Waste Regulations; promulgation of regulations regarding hygiene standards in barber shops, hair salons, and related public establishments; and amended public health regulations regarding tourist attractions and swimming pools. The WHO Framework Convention on Tobacco Control was ratified by Jamaica in July 2005.

Health Strategies and Programs

Protection of vulnerable population groups from the risks associated with limited access to public services and of those possessing insufficient means to fulfill basic human needs remained a high government priority. The Social Safety Net Reform Program, which began in 2000, continued to streamline the delivery of welfare and social security benefits to needy families and individuals in a more structured, targeted, and efficient manner. Since 2002, the Poverty Alleviation through Health and Education (PATH) program has provided cash benefits to poor families with children, individuals living in extreme poverty, pregnant and lactating women, the elderly, and persons with disabilities, and links these benefits to preventive health care (primary care clinic attendance) and education. The National Health Fund (NHF), established in 2002 as a statutory body and whose budget is funded from government taxes, provides two categories of benefits. NHF Individual Benefits provide assistance for the purchase of specific prescription drugs used in the treatment and management of designated chronic illnesses. NHF Institutional Benefits provide assistance to private and public sector organizations for health-related projects. Within this category, the Health Promotion and Protection Fund provides financial assistance for initiatives supporting primary health care, with special emphasis on health promotion and disease prevention.

The older population suffering from chronic diseases benefits from the Jamaican Drugs for the Elderly Program and NHF assistance. Additionally, the National Council for Senior Citizens acts in an advisory capacity to the Ministry of Labour and Social Security and provides input on all matters relating to the socioeconomic welfare of the population 60 years of age and older.

Organization of the Health System

Health services delivery in the public sector is provided through a network of primary, secondary, and tertiary care facilities consisting of 24 hospitals, including the University Hospital of the West Indies. Hospitals are classed as "A," "B," "C," or "Specialist," depending on the level of complexity of the services offered. There are three type A hospitals, all located in large urban areas and providing the most specialized services; of the three, one offers specialized obstetrics services and another specialized children's services. The four type B hospitals, as the type A hospitals, are mostly situated in urban areas. They provide inpatient and outpatient services in general surgery, internal medicine, obstetrics and gynecology, and pediatrics, and support referrals from type C facilities, of which there are currently 11 in the country. These hospitals are usually found in rural population centers, provide general outpatient and inpatient services, and refer complex cases to type B and A facilities. There are currently four specialist hospitals, with one providing psychiatric services, another cancer care, a third rehabilitation services, and the fourth specialist pulmonary services. In 2005, the bed complement was 4,736, and there were 1.8 hospital beds per 1,000 population.

A major strategy of the health sector reform process was the decentralization of government health services. The passage of

the National Health Services Act in 1997 led to the formation of four Regional Health Authorities (South East, North East, Western, and Southern). Each region has direct managerial responsibility for the delivery of public health services within a geographically defined area. A 2003 evaluation (*37*) of the impact of decentralization found minimal levels of improvement in health planning, services delivery, accountability and transparency, and community involvement. While moderate success was shown in the area of cost containment, negative effects were shown in the areas of personnel capacity, financial management, and organizational capacity. An evaluation of essential public health functions carried out in December 2001 identified the following as the weakest functions: quality assurance, health promotion, research, and human resources development and planning. Special emphasis was given to strengthening these four areas in the drafting of the new national strategic health plan.

Public Health Services

Jamaica has pursued the primary health care approach since the 1970s, and its achievements utilizing this strategy include a reduction of undernutrition, infant mortality, and fertility rates; an increase in immunization coverage; the elimination of polio and measles; improved sanitation status; the creation of a strong health centers network and of a new cadre of health workers (examples include the community health aide and the nurse practitioner); and strong local government engagement in health services.

Primary care facilities comprise 316 health centers, ranging from type 1 to type 5 and offering progressively more complex services, from maternal and child health services only in type 1 clinics, to curative, dental, STI, and mental health services in the others. Public sector hospitals provide more than 95% of hospital-based care on the island. The private sector dominates pharmaceutical and diagnostic services and provides about half of the ambulatory care through an extensive network of professionals offering specialist and general practice services. Nongovernmental organizations and other groups provide health services at a nominal fee.

Eleven hospitals (representing 70% of the public patient population) have a computerized Patient Administration System (PAS) in place. The basic information system for secondary care is supported by the PAS. The primary care system is not computerized. There is a multiplicity of databases for various programs resulting in fragmentation of the health information system. A vital statistics commission appointed by the Cabinet in 2004 has received the mandate to ensure the production of timely and accurate vital statistics. To that end, an audit was facilitated by PAHO in 2005, and recommendations currently are being implemented.

Disease surveillance is conducted using both active and passive systems, and includes public and private sentinel primary care facilities, hospitals, laboratories, and selected hotels. There is syndromic sentinel surveillance for fever, fever and rash, gastroenteritis, and accidents and violence. Data obtained from the various surveillance systems are disseminated nationally via weekly bulletins and internationally via weekly reports to the Caribbean Epidemiology Center (CAREC). In 2004, on-time reporting was over 95%. The class I surveillance system geared at reporting communicable diseases also includes events such as maternal deaths, rheumatic fever, accidents, and poisoning. The Jamaica Injury Surveillance System continues to operate from the major public hospitals. Surveillance for HIV/AIDS cases is carried out by case-finding and active and passive surveillance. Active surveillance is carried out by contacting laboratories, hospitals, hospices, and public and private physicians. Collaboration continued with the National Public Health Laboratory, the University Hospital of the West Indies, and CAREC for confirmation of cases of diseases.

Drinking water in Jamaica is provided mainly through such public agencies as the National Water Commission (71%) and the parish councils (rural water supplies) and by various private companies. Monitoring of water quality is the joint responsibility of the Ministry of Health, the National Water Commission, and the Office of Utilities Regulation. A water surveillance program was established jointly between the Ministry of Health and the National Water Commission. The Ministry determines residual chlorine levels, and, to a lesser degree, conducts bacteriological analysis, while monitoring by the National Water Commission is of a more frequent and complex nature.

A 2004 PAHO report (*38*) raised concerns regarding how water quality monitoring is carried out at the parish level, in terms of ratio of quantity of sampling versus population served, the frequency of sampling, and the disparity of standards used between parishes.

The 2001 national census (*12*) indicated that approximately 20,000 households (2.6%) were not provided with excreta disposal facilities, while approximately 119,000 households (15.9%) did not have a hygiene facility (shower, sink) in their home.

While there was a 50% increase in the number of cases of diarrheal diseases in the under-5 age group for the year 2003 compared with 2002, national efforts to deal with these diseases are focusing on the curative aspects and health education, and not on water quality and sanitation. Solid waste management in Jamaica is legislated under the 2001 National Solid Waste Management Act with its corresponding regulations for licensing, rates, recycling, and management of hazardous waste. The National Solid Waste Management Authority is the governmental regulatory agency overseeing this sector and four wastesheds in a shared solid waste disposal system. The collection of solid waste is subcontracted to private enterprises through a public-private sector arrangement. While there are four landfills island-wide, none satisfy the minimum requirements necessary to qualify as sanitary landfills. The 2002 PAHO Regional Evaluation of Solid Waste Management in Latin America and the Caribbean (*39*) reported

that Jamaicans produce 2,670 tons of domestic waste daily (56% organic in composition). Coverage for municipal solid waste collection was reported at 63%.

According to a 2001 State of the Environment Report prepared by the Statistical Institute of Jamaica (*40*), mining and quarrying activities are responsible for more than 50% of air emissions in Jamaica. The 2001 census (*12*) indicates that 43% of all households burn their solid waste. The four landfills for solid waste disposal on the island are frequently on fire, thereby contributing to air pollution and producing other environmental effects detrimental to the health of nearby residents.

With more than 150 licensed hotels and 13,500 rooms, Jamaica is heavily dependent upon tourism. Mass tourism in particular has been promoted and developed. In 2004, the island's visitors, including cruise ship passengers, totaled 2.5 million, nearly equaling the total national population. The tourism and economic sectors are in turn highly dependent upon the country's natural resources and thus vulnerable to any degradation of coastal resources. During recent decades, negative impacts from improperly planned urban and tourism developments, including the introduction of inadequate sanitation and solid waste disposal practices, have affected water quality and near-shore ecosystems, especially in the important northern and northwestern tourism destinations (*41*). According to a 2000 study on the negative effects of tourism on Jamaica's ecology, tourists consume 10 times as much water and produce three times as much solid waste as the average resident (*42*), and ship-generated waste (cruise and commercial) is usually discharged at sea.

Some positive initiatives have been taken by the government with support from international agencies and local nongovernmental organizations. Among these is the introduction of Green Globe Certification in 2005, with the first five hotels in the world to receive Green Globe 21 Certification being located in Jamaica. (Green Globe 21 is a global affiliation, benchmarking, and certification system aimed at stimulating sustainable, ecologically responsible tourism and is based on the Agenda 21 principles for sustainable development endorsed by 182 Heads of State at the U.N. Rio de Janeiro Earth Summit in 1992.) The results have been significant in reducing water, chemical, and energy consumption, as well as solid waste output (*41*). Blue Flag certification, an international voluntary certification program, was introduced in Jamaica in 2005 as an environmental tool to stimulate proper planning and management of coastal recreation. Under the award system, beaches that fulfill a number of exacting criteria regarding such factors as bathing water quality, cleanliness, and safety are given the right to fly the Blue Flag; five beaches achieved this distinction in 2005 (*1*).

Nearly a decade ago, travelers' diarrhea (TD) was recognized as a major health problem affecting tourists visiting Jamaica. A survey carried out between March 1996 and May 1997 (*43*) indicated that one in every four tourists to Jamaica experienced TD during their stay. Interventions to reduce TD in hotels in Negril and Montego Bay have been implemented by the Ministry of Health in collaboration with the Ministry of Tourism and hotel associations and have been progressively extended to all parishes offering tourism attractions. These included Hazard Analysis Critical Control Points (HACCP) training for hotel managers and supervisors, hotel food handlers' certification, and hotel certification. A surveillance system reporting on diarrhea, acute respiratory infections, and accidents among guests and staff was established in 34 hotels in seven parishes. Currently, all four major tourist regions report to local public health departments and the Ministry of Health and the national TD incidence rate stands below 5%. Accident rates have also declined for both staff and guests in recent years; where rates remain proportionately high, local public health departments work with individual hotels to identify and resolve safety issues.

HACCP training is seen as a priority to reduce the risks of foodborne diseases in the hospitality industry. Investigations carried out in collaboration with CAREC and the U.S. Centers for Disease Control and Prevention following an increase in reports of hotel-based foodborne disease outbreaks following Hurricane Ivan in 2004 resulted in interventions to monitor the quality of eggs. A new policy and procedures manual for the training of food handlers was used to operate 65 food handler training sites island-wide in 2004. This resulted in a 38% increase in the number of food handlers trained between 2003 (25,281) and 2004 (34,808).

In 2005, 116 occupationally related accidents were reported to the Ministry of Labour and Social Security, an increase of 16% over the previous year. Of these cases, 66% qualified for investigation. There were six deaths related to on-the-job incidents. There is, however, severe underreporting in this area.

Subsequent to the 2004 hurricane season, the Jamaican government commissioned the upgrading of the national building code. The 2005 hurricane season further highlighted Jamaica's vulnerability to flood and landslides. Risk-reduction measures are being promoted to help ensure the operation of essential services during hurricane and tropical storm events.

In 2003, a national program for the surveillance of West Nile virus was launched. Jamaica is also on high alert with regard to a potential introduction of avian influenza in the local wild bird and commercial poultry populations. Avian influenza surveillance was introduced in 2005 in collaboration with the Ministry of Agriculture and the Poultry Association. To date, there has been no appearance of highly pathogenic avian influenza (HPAIV) in the commercial poultry population. The introduction of HPAIV would have serious consequences for the national economy and directly impact on food security, since 86% of the population's protein consumption comes from poultry.

All pharmaceutical products containing ingredients of animal origin are screened for bovine extracts. A ban was placed on imported beef and beef products from several countries in 2003 and continues in some cases.

Promoting Healthy Lifestyles among Jamaican Youth

Three of the leading causes of mortality among adults in Jamaica are chronic noncommunicable diseases, which account for half of all deaths each year; HIV/AIDS, with a 1.5% prevalence rate among adults and ranking as the second leading cause of death among both men and women 30–34 years old; and homicides, which reached epidemic proportions in 2005, with a rate of 63 deaths per 100,000 population. To help combat the burden from these causes, the government has formulated a National Policy for the Promotion of Healthy Lifestyles that brings together public, private, and nongovernmental sectors to encourage young children, adolescents, and young adults to adopt good habits such as physical exercise, good nutrition, and responsible sexual behavior and acquire skills such as self-esteem and resilience.

Individual Care Services

During the period 2001–2005, attention was focused on the restructuring of mental health services. At the current time, emphasis is placed on deinstitutionalization, integration of the mental health component into general health care, and the training and retraining of mental health workers and their reassignment in the community. Mental health care is delivered through secondary and outpatient services. There is one psychiatric hospital (Bellevue) and two psychiatric units. Eleven of the general hospitals also offer psychiatric services. There are presently 111 mental health clinics operating island-wide, either through primary health care centers and/or the outpatient clinics of general hospitals. In addition, several churches provide community mental health services. In 2005, Bellevue Hospital saw its acute inpatient days decrease to 14 days for females and 28 days for males, compared to more than 60 days prior to 1998. This achievement has been part of an ongoing effort to reintegrate patients as quickly as feasible into their families and communities.

Mental health services targeted to children and adolescents have expanded from three locations in the South East Region to a decentralized network of clinics in all four Regional Health Authorities. In addition to clinical services, technical guidance and support, including training in the management of children and adolescents with mental health problems, are provided by the central level to the regions. Guidelines for the management of child abuse were developed in 2005, and 100 health workers received training in this area.

The mandate of the National Council on Drug Abuse is the alleviation of drug abuse through the development and implementation of effective drug prevention programs. Target populations include youth with both high and low literacy levels, parents, the community at large, the workplace, and service clubs. Activities include the generation of evidence-based information on substance abuse, training and health promotion, social mobilization, and advocacy. In 2005, a Caribbean database information network on poisons and poisonous substances was launched and will operate out of the University of Technology.

Rehabilitation services offered in the public sector include physiotherapy, social work, speech therapy, and occupational therapy. Private therapists provide a variety of services, although these are usually available only in the larger urban centers. The 71-bed Sir John Golding Rehabilitation Center located in Kingston offers short- and long-term rehabilitative services. Nongovernmental organizations at the Center provide support for those with disabilities by making prostheses, shoes, and wheelchairs; operating a crafts workshop; and assisting with the provision of schooling, skills training, and housing.

Dental services are essentially provided through primary care. Dentists principally perform extractions while the work of dental nurses is focused mainly on the 0–18-year-old population segment and includes restorative and preventive procedures.

Oncology treatment, intensive care, and renal dialysis are offered in the three type A hospitals. Intensive care additionally is offered at the specialist Bustamante Children's Hospital in Kingston. Two private and one nongovernmental facility offer dialysis services.

Public health laboratories provide testing services in the major public hospitals. The Kingston-based National Public Health Laboratory is a referral facility offering services in microbiology, cytology, hematology, chemistry, histology, immunology, and environmental testing.

The National Blood Transfusion Service serves both public and private clients and receives blood from 10 collection centers. Collection in 2005 reached an all-time low of approximately 22,000 units, insufficient to meet national demand, and representing a decline of 6% over 2004's collection levels. The majority (90%) of the units are collected from family and replacement donors. Only 10% of the donors are considered to be voluntary. In response to the national blood shortage, successful new partnerships have been forged with the private sector, the media, and academic institutions at the secondary and tertiary level to encourage voluntary blood donation.

A broad intersectoral approach has been adopted by many other programs within the Ministry of Health, as well, including

HIV/AIDS, mental health, health promotion and healthy lifestyles, environmental health, nutrition, and violence prevention. Partners include governmental and nongovernmental organizations, academic institutions, and community groups, among others.

Health Promotion

The 2004 National Policy for the Promotion of Healthy Lifestyles in Jamaica incorporates the public and private sectors, government and nongovernmental organizations, and communities in an intersectoral approach to address national health priorities. The policy's goal is to decrease the incidence of chronic diseases (heart disease, diabetes, hypertension, obesity, and cervical cancer), as well as discourage the practice of high-risk sexual behaviors and those leading to violence and injuries through the adoption of health-promoting behaviors by the general population and, particularly, young children, adolescents, and young adults. Other key behavioral elements promoted through the policy's strategic plan include physical activity, healthy nutritional habits, smoking prevention and/or cessation, and the building of self-esteem, resiliency, and life skills.

During the 2001–2005 review period, the Ministry of Health oversaw and/or facilitated various programs and interventions to address violence-related issues. These included the community-based Healthy Lifestyle Initiative in the violence-prone Mountain View area of the South East Region, and CAMP Bustamante (Child Abuse Mitigation Project), a UNICEF-supported initiative operating out of Bustamante Children's Hospital that identifies children in the community who have been victims of physical and sexual abuse and/or neglect and carries out interventions targeting these children and their parents or caregivers.) Progress also continued during the review period as regards the Change From Within program, which is funded by UWI and promotes a child-centered approach to teaching in which schools address children's emotional needs and social development and support synergistic positive change at four levels: individual, parents and home, the school environment, and the community as a whole. In November 2004, the Jamaican chapter of the Violence Prevention Alliance (VPA) was launched. International in scope, the VPA is an intersectoral nongovernmental initiative that promotes violence prevention through information-sharing and the strengthening of policies related to this issue.

Encouraging male participation in both preventive and curative health care services remains a challenge in Jamaica. Family planning materials specifically targeting males were developed and disseminated in 2005. An integrated approach to family health following a life cycle approach has been initiated by the Ministry of Health and is reflected in the new draft family health manual. During the 2001–2005 period, efforts were geared at integrating adolescent health and care for the elderly within the primary health care level of services.

Human Resources

The health sector continues to be faced with a severe shortage of health personnel in many key categories, with the exception of medical doctors. The total vacancy for registered nurses increased from 17% in 2003 to 26% in 2004. Vacancy rates for enrolled assistant nurses and public health nurses increased by 12% and 13%, respectively. Shortages also exist among registered pharmacists, radiographers, community mental health workers, health educators, and public health inspectors. The chief reasons cited for the chronic shortage of public health services professionals are emigration to Canada, the United States, and Great Britain and to the local private sector, in addition to a general dissatisfaction with working conditions. There are also salary and emolument disincentives to staff working in primary versus secondary health care, which ultimately skews the available services away from the more preventive aspects of health care. Inequalities in staff distribution also exist between rural and urban areas, with the majority of health personnel opting to work in the country's larger cities. Even though the government has embarked on a program of recruitment of health professionals from other countries, such as Cuba and Nigeria, this is considered to be only a short-term solution. Training programs are offered for all categories of health personnel at the basic and post-basic levels, with the availability of several nursing schools and universities. However, due to ongoing reductions in the availability of training funds, many students are unable to begin and/or continue their intended course of studies. In addition, there are more applicants than available places. This results in insufficient numbers of graduates each year in several disciplines. In 2003, the Ministry of Health reported 8.5 public sector physicians and 16.5 public sector nurses per 10,000 population.

Health Supplies

There is limited drug production in Jamaica from imported raw materials. The Ministry of Health's Standards and Regulations Unit provides information regarding the quantities of drugs imported and by whom to the International Narcotics Control Board as part of the Unit's reporting relationship for precursor chemicals and controlled substances. The importation of raw materials, drugs, vaccines, and laboratory reagents is regulated, monitored, and controlled through drug registration and import permit approval by the Ministry of Health. Jamaica has a thriving private drug distribution (retail trade). Local distributors register drugs and obtain import permits on behalf of the manufacturers. The procurement and distribution of pharmaceuticals and medical supplies for the public health sector is carried out through Health Corporation Limited, an agency of the Ministry of Health with statutory status. There is a system of pharmacovigilance in place to ensure quality maintenance. Quality assurance support is also provided by the Government Chemist and the Caribbean Drug Testing Laboratory. Over 90% of the vaccine supplies for the

national immunization program are procured through the PAHO Revolving Fund for Vaccine Procurement. The Vital, Essential, and Necessary (VEN) list was updated in 2005 and guides public sector prescribing, while the National Drug Formulary, also designed by the Ministry of Health, is for wider use in the private sector.

Research and Technological Development in Health

Numerous linkages with UWI, the Caribbean Health Research Council, and other regional and international organizations have guided research initiatives and training within the Jamaican health services. The first-ever Caribbean Research Ethics Conference, organized by UWI, the University of Miami, and PAHO, was held in 2005 at UWI. The use of laparoscopic techniques for diagnosis and treatment has increased service delivery options and contributed to decreased morbidity and length of stay for many surgical conditions. Computerized axial tomography (CAT) scanning is now available in the public sector. Additionally, other machines such as magnetic resonance imaging (MRI) and top-of-the-line radiotherapy facilities are available in the private sector. CD4 count and polymerase chain reaction (PCR) testing were introduced in the public sector in 2005.

Health Sector Expenditures and Financing

Financing of the health sector comes primarily from governmental budgetary allocations that are supplemented by user fees and inputs from nongovernmental organizations and international development partners. During fiscal year 2004–2005, there was a 13.7% increase in the total governmental budgetary expenditure over 2003–2004, with the Ministry of Health receiving US$ 245 million, representing 4.5% of the government overall budget. Approximately 83.0% of the increase in the health allocation went toward paying accumulated outstanding statutory deductions. User fees, which are collected from clients at health centers, hospitals, and various other government facilities, represented 14% of the government's budgetary allocation and are therefore an important source of income for the Regional Health Authorities. US$ 215 million, or 90.4% of the Ministry of Health's recurrent budget, was supplied to the four Regional Health Authorities and the University Hospital of the West Indies to provide health services to the population (*25*). Pharmaceutical expenses accounted for 20% of total health expenditure. The public health sector's budget represented 2.7% and 2.6% of GDP at current prices in 1999 and 2002, respectively (*44*). Government expenditure on health (i.e., the sum of outlays for health maintenance, restoration, or enhancement paid for by government entities as a percentage of total health expenditure) was 56.7%, while private expenditures accounted for 43.3%. Net out-of-pocket household expenses for health care were 63.6% of private health expenditures. Expenditure data from fiscal year 2004–2005 revealed that human resources cost was 82.6% of the total recurrent expenditure for the Regional Health Authorities, compared to 79.3% in 2003–2004, which is indicative of a clear risk that non-wage health expenditures are being squeezed, affecting service delivery. In addition, the total government expenditure on health remained virtually the same between 1998 and 2004, during which time the expenditure percentage ranged from 45.7% to 58.6%, with a mean of 52.2%. During this period, there has also been a steady devaluation of the Jamaican dollar from J$ 37.2 = US$ 1 to J$ 61.4 = US$ 1, a devaluation of 63%. This has further impacted on the government's ability to provide adequate health services to the population.

Technical Cooperation and External Financing

During the 2001–2005 review period, Jamaica received assistance from the U.S. Agency for International Development, Inter-American Development Bank, United Kingdom Department for International Development, World Bank, and European Union, among others. Up to the end of 2005, new Official Development Assistance totaled US$ 19.8 million.

In 2002 the World Bank granted the Jamaican government a loan of US$ 15 million for its HIV/AIDS control program. This support was followed in 2003 by a US$ 23 million grant from the Global Fund to Fight AIDS, Tuberculosis, and Malaria.

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