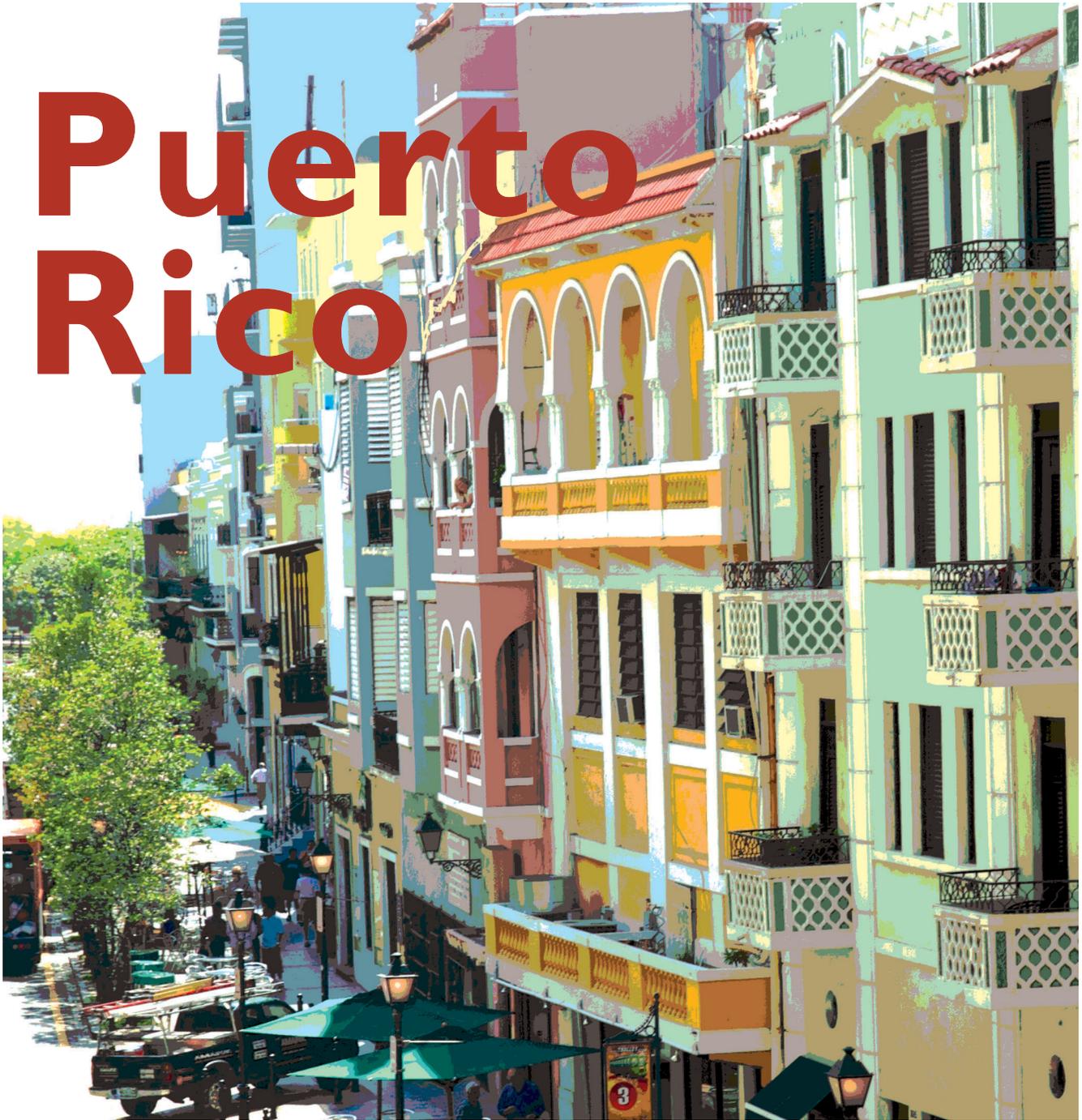


Puerto Rico

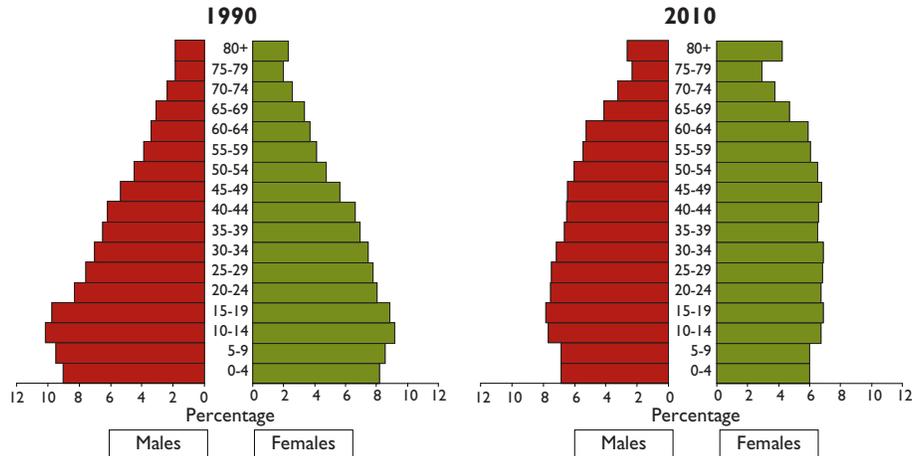


INTRODUCTION

The archipelago of Puerto Rico includes the main island of Puerto Rico (the smallest of the Greater Antilles) and a number of smaller islands, the largest of which are Mona, Vieques, and Culebra. The total area of the main island is 9,105 km² and it measures approximately 170 by 60 km. Its climate is tropical and, despite its size, several ecosystems are present: coastal and marine, dry forests and rainforests, the

Puerto Rican karst, and mountainous areas. The capital is San Juan, located on the northern coast of the main island.

According to the 2010 census, Puerto Rico had a population of 3,725,789, which represents a reduction of 82,821 inhabitants (2.2%) as compared to the year 2000 (Figure 1). This was a historic change, as the population of Puerto Rico had never before declined from one census to the next. The main factors that influenced this change

FIGURE I. Population structure, by age and sex,^a Puerto Rico, 1990 and 2010.

The population increased 13.3% between 1990 and 2010. In 1990, the population structure displayed a pyramidal shape with significant representation of various ages up to persons older than 80 years, which was related to the aging of the population and low mortality; age groups younger than 10 years tended to decrease. By 2010, the pyramidal shape shifts toward age groups older than 50 years, and the structure shows relative similarity in age groups younger than 60 years, reflecting an ongoing relatively low fertility and mortality in the last six decades.

Source: United States Census Bureau. International Database, 2009 (updated December 2010).

^a Each age group's percentage represents its proportion of the total for each sex.

were emigration (particularly to the United States) and a 26% reduction in births between 2000 and 2010.

A reduction in population was observed in 42 of the 78 municipalities of Puerto Rico. Even though it continues to lose population, the municipality of San Juan is still the largest, with 395,326 inhabitants, followed by Bayamón, with 208,116. Most municipalities that experienced an increase in population are located in the north-east area of the island, with Gurabo presenting the greatest relative increase in population (23.5%) as compared to 2000. The increase in this region was due mainly to internal migration that occurred between the 2000 and 2010 censuses.

Puerto Rico is a territory of the United States with commonwealth status. In 1952, the Constitution of the Commonwealth of Puerto Rico was approved, establishing the archipelago's own system of government with administrative autonomy for internal affairs, but subject to U.S. federal law and regulations. The Government is divided into three branches: the executive, the

legislative, and the judicial, each with its corresponding power and authority. The Executive Branch is headed by the Governor, who appoints the cabinet. The Legislative Branch consists of a bicameral Legislative Assembly made up of the Senate (27 members) and the House of Representatives (51 members) (1). The Judicial Branch consists of the Supreme Court and the lower court system. Puerto Rico is organized into 78 municipalities, each run by a mayor and municipal assembly. Officials, both at the state and municipal level, are elected in general elections held every four years.

The economy of Puerto Rico has undergone a depression since the first quarter of 2006. From 2006 to 2008, it was considered a recession, but with the prolonged downturn through 2010 it has been termed a depression (2). According to the Government Development Bank's Economic Activity Index, the economy began to contract in fiscal year 2006 (-2.1%) and has remained in recession since, with a severe decline in 2009 (-6.4%) and further contraction (-3.7%) in 2010 (3).

HEALTH DETERMINANTS AND INEQUALITIES

Despite the economic downturn that has affected Puerto Rico since 2006, the poverty level of the population remained steady at around 45% during the 2006–2010 period. According to 2010 data, poverty is greater among female heads of household (57.7%) and people under age 18 (56.3%). Similarly, people who live in rural areas experience a higher level of poverty (56%) than those who live in urban settings (44%) (4).

According to the most recent Census Bureau data, 22.3% of the population aged 25 or older had a bachelor's degree or higher, and 69.5% had a high school education or higher. This represents an increase as compared to 2006, when 20.7% had a bachelor's degree and 66.1% had completed at least the fourth year of high school (4).

THE ENVIRONMENT AND HUMAN SECURITY

On 23 October 2009, an explosion and fire occurred in the Caribbean Petroleum Corporation facilities in Cataño. The explosion of 16 of the 40 fuel storage tanks on site and the resulting fire released fuel into the wetland close to the property. The community of Puente Blanco worked continually to restrict the flow of fuel toward local wetlands and Caño La Malaria. Protective measures were adopted, including daily inspection of local bodies of water and of the wetland area (5).

In 2006–2007, the Environmental Health Program of the Puerto Rico Department of Health carried out 19,493 health inspections. The Department's drinking water program carried out 612 inspections, thus meeting 100% of its target; the milk hygiene program completed 52.9% of the 1,523 expected inspections; and the program for hygiene in food preparation and service establishments and zoonosis program completed 422 and 233 inspections, respectively, meeting 100% of their targets as well (6). Carbon dioxide emissions, which affect the environment and produce air pollution in Puerto

Rico, were 14.3 and 14.6 metric tons of CO₂ per capita in 2006 and 2007, respectively (7).

HEALTH CONDITIONS AND TRENDS

HEALTH PROBLEMS OF SPECIFIC POPULATION GROUPS

Maternal and Reproductive Health

The number of births declined considerably during the 2006–2008 period. According to data from the Department of Health Division of Vital Statistics, there were 48,744 births in Puerto Rico in 2006 (a crude birth rate of 12.4 per 1,000 population). The general fertility rate was 57.4 per 1,000 women aged 15 to 49. The highest fertility rate was observed among women aged 25 to 29 (87.7 per 1,000). In 2008, 45,689 live births occurred, which represents a 6.3% reduction in comparison with 2006. In 2008, almost half of deliveries were carried out by cesarean section (48.5%), and 12.5% of newborns had low birthweight (8).

Very few maternal deaths are reported annually in Puerto Rico. According to the 2006 report on vital statistics, the maternal mortality rate was 4.1 per 100,000 live births. The highest maternal death rate was observed among women aged 30 to 34 (12.9 per 100,000). The most frequent causes of death were ectopic pregnancy and placenta previa (8).

Children (under 5 years old)

The infant mortality rate in Puerto Rico was 8.5 per 1,000 live births (396 deaths) in 2007 and 8.7 (397 deaths) in 2008. In 2007, mortality was 9.4 per 1,000 live births for boys and 7.5 per 1,000 for girls. A similar pattern was observed in 2008, when the infant mortality rate was 9.6 per 1,000 for boys and 7.8 per 1,000 for girls. According to 2006 data, the most frequent causes of death in children were disorders related to short gestation and low birthweight (393.9 per 100,000 live births); congenital malformations, deformations, and chromosomal

abnormalities (137.5 per 100,000); and septicemia (32.8 per 100,000) (8).

According to the 2009 Asthma Surveillance Report, 29 out of every 100 children were diagnosed with asthma by a health professional (29.1% and 28.4% in 2006 and 2007, respectively). The overall prevalence of asthma was 14.0% in 2006. In 2007, the prevalence of asthma was higher in boys (14.7%) than in girls (12.4%) (9).

Schoolchildren (10–14 years old)

In 2007, a study was conducted on 15,558 grade 5–12 students (ages 10–14) in 158 public and private schools in Puerto Rico to measure the main risk factors to which these children and adolescents were exposed (9). The study revealed that 34.6% of elementary school students (fifth- and sixth-graders) drank alcohol, 2.9% used inhalants, and 1.5% smoked cigarettes. Boys were more likely to use alcohol, illegal drugs, and cigarettes (37.7%, 4.4%, and 2.3%, respectively) than girls (31.1%, 2.5%, and 0.6%, respectively) (10).

According to vital statistics data, 33 youths between the ages of 10 and 14 died in 2008 (11.8 deaths per 100,000 inhabitants aged 10 to 14). The leading cause of death was accidents (3.9 per 100,000), accounting for approximately one-third of all deaths in this age group.

Adolescents (10–19 years old)

In 2008, 291,773 adolescents (aged 10 to 19) lived on the island. In that year, 201 deaths occurred in this population (rate of 68.9 per 100,000 adolescents). The leading cause of death was homicide, with a rate of 30.2 per 100,000 adolescents, which represents 43% of all deaths in that age group.

The Comprehensive Adolescent Health Services Program reported that in 2008 17.8% of births were to teenage mothers between 10 and 19 years old (11). Of these, 61.3% were 18 or 19 years old, 36.9% were 15 to 17, and 1.8% were younger than 15. Teenage pregnancy has consequences on physical, mental, and emotional health, as well as in the economic situation of adolescents. A study

carried out by the Mothers, Children, and Adolescents Section of the Department of Health showed that, in 2008, only 24.4% of teenage mothers had planned their pregnancies (11). This study also revealed that the majority of health professionals regard pregnancy among adolescents as a serious public health issue with many adverse effects on the health and well-being of mother and child alike.

The most common risky behaviors among youth in this age group were alcohol consumption (56.2%), cigarette smoking (16.0%), and marijuana use (7.0%). Disaggregation by sex showed that males consumed cigarettes (18.5%) and illegal drugs (12.8%) more than females (13.6% and 8.6%, respectively); however, the prevalence of alcohol consumption was similar in both sexes (56.3% for females and 56.2% for males) (10).

The Elderly (65 years old and older)

Older adults are one of the fastest-growing population groups in Puerto Rico. According to 2010 census data, there were 541,998 inhabitants aged 65 or older, or 14.5% of the total population. In 2008, the three leading causes of death in this group were heart disease (819.2 per 100,000), malignant neoplasms (669.5 per 100,000), and diabetes mellitus (404.5 per 100,000). According to data from the Behavioral Risk Factor Surveillance System (BRFSS), the prevalence of myocardial infarction in people aged 65 to 74 was 11.7% in 2006 and 9.8% in 2010; in those aged 75 or older prevalence was 17.7% in 2006 and 15.7% in 2010 (12).

Other Groups

Persons with Disabilities

The proportion of persons with disabilities (those using some form of adaptive equipment such as a cane, wheelchair, special bed, or special telephone) over the age of 18 was 8.2% in 2006 and 7.8% in 2009. In 2009, the prevalence of disability was lower among women (7.7%) than in men (8.0%). The prevalence of disability increases with age; in 2009, the prevalence was 12.3% in the 55–64-year age

group, 16.5% in the 65–74-year age group, and 29.5% in those 75 or older (12).

In 2006, according to the Puerto Rico Community Survey, 62.7% of people aged 65 and older had some disability; this rate was 52.0% in 2010. Also in 2010, 8.9% of all women and 8.4% of all men aged 35 to 64 had some disability (4).

MORTALITY

The Puerto Rican Statistical Institute report on mortality indicated that the crude mortality rate was 729.3 per 100,000 population in 2006 and 735.9 per 100,000 in 2008. Also in 2008, the mortality rate was lower among women (641.5 per 100,000 women) than among men (838.2 per 100,000 men) (13). Throughout the 2006–2008 period, chronic diseases were the predominant causes of death; the three leading causes were heart disease, malignant neoplasms, and diabetes mellitus (see Table 1). Deaths registered in 2008 that were due to heart disease (135.4 per 100,000) were less prevalent in women (120.2 per 100,000) than in men (151.9 per 100,000). Cancer deaths (126.6 per 100,000) followed a similar pattern: mortality from malignant

neoplasms was 105.3 per 100,000 in women and 149.8 per 100,000 in men. Diabetes was the third leading cause of death (72.1 per 100,000), with a mortality of 73.8 per 100,000 among men and 70.5 per 100,000 among women (13).

MORBIDITY

Communicable Diseases

Vector-borne Diseases

In 2007, an epidemic of dengue with 10,508 suspected cases occurred. In 2009, 6,651 suspected cases were reported, of which 33% were laboratory-confirmed, with 63 dengue hemorrhagic fever cases. In 2010, dengue cases reached a historic high for Puerto Rico. By 30 December 2010, 21,298 cases had been recorded, 46% of which were laboratory-confirmed (14).

HIV/AIDS and Other Sexually-transmitted Infections

As of February 2010, a total of 34,042 cases of AIDS and 22,147 deaths of people diagnosed with AIDS

TABLE 1. Number and percentage of deaths, and mortality rate (per 100,000 population), for the 10 leading causes of mortality, by sex, Puerto Rico, 2008.

Cause	Overall			Men		Women	
	Number	Percentage	Rate	Number	Rate	Number	Rate
All causes	29,100	100	735.9	15,906	838.2	13,194	641.5
Heart disease	5,356	18.4	135.4	2,883	151.9	2,473	120.2
Malignant neoplasms	5,008	17.2	126.6	2,842	149.8	2,166	105.3
Diabetes mellitus	2,852	9.8	72.1	1,401	73.8	1,451	70.5
Alzheimer's disease	1,591	5.5	40.2	537	28.3	1,054	51.2
Cerebrovascular diseases	1,529	5.3	38.7	699	36.8	830	40.4
Chronic respiratory diseases	1,200	4.1	30.3	588	31.0	612	29.8
Accidents	1,097	3.8	27.7	842	44.4	255	12.4
Nephritis, nephrotic syndrome, and nephrosis	1,058	3.6	26.8	601	31.7	457	22.2
Influenza and pneumonia	949	3.3	24.0	488	25.7	461	22.4
Septicemia	861	3.0	21.8	450	23.7	411	20.0

Source: Reference (13).

had been reported to the AIDS Surveillance Program of the Department of Health since the beginning of the epidemic. Over the same time period, 415 children under the age of 12 (1.22%) had been diagnosed with AIDS; 94.5% of these acquired the infection by perinatal transmission. Nearly half (48.5%) of the adolescents and adults living with HIV attributed the infection to intravenous drug use. During the 2003–2008 period, 6,801 new cases of HIV/AIDS were diagnosed. There was a steady decline in the incidence of HIV/AIDS between 2006 and 2008: in 2006, incidence was 28.93 per 100,000 inhabitants; in 2007, it was 25.22; and in 2008 it was 23.65. In 2008, the rate among women (12.5 per 100,000 population) was lower than in men (35.2 per 100,000). The male-to-female ratio was 2.8:1 (15).

The Office for Surveillance of Sexually Transmitted Diseases reported that in 2010 there were 5,995 cases of chlamydial infection, 81.1% of which occurred in women. There were 313 cases of gonorrhea, with 54.6% in men. During 2010, 228 cases of primary and secondary syphilis were recorded; infection was more prevalent in men (209 cases, 92%) than in women. Also in 2010, there were 192 cases of early latent syphilis (77% in men), with an incidence rate of 4.9 per 100,000 population, and 289 cases of late latent syphilis, with an incidence rate of 7.3 per 100,000 population. There were nine cases of congenital syphilis in 2008 and six in 2009 (16).

Tuberculosis

In 2006, 112 cases of tuberculosis were reported, for a rate of 2.9 per 100,000 population; 67% of cases occurred in men. The 45–64-year age group was most affected (36%). Disease was pulmonary in 92% of cases (17).

Emerging Diseases

In 2009, according to data provided by the Puerto Rico Vaccination Program, 638 cases of influenza A(H1N1) were reported, with a case-fatality rate of

5.8%. The incidence rate of influenza A(H1N1) in August 2009 was 37.71 cases per 100,000 population (with 5.89 confirmed cases per 100,000). The age groups 0 to 29 months and 15 to 19 years had the highest rates of confirmed cases (15.11 and 15.02 per 100,000 population, respectively) (18).

In 2008, an outbreak of multiresistant *Klebsiella pneumoniae* disease with person-to-person transmission of the bacterium was reported (18). There were 26 cases acquired in a hospital in Ponce. The average age of affected patients was 68 years, and 50% were men. Surveillance was established and maintained in area hospitals near the site of the outbreak (19).

Chronic, Noncommunicable Diseases

Cardiovascular Diseases

The information on morbidity compiled by the BRFSS was obtained through a survey carried out by means of telephone interviews of people aged 18 and older. The prevalence of coronary disease increased from 6.7% in 2007 to 7.0% in 2009; prevalence was higher in women (7.7%) than in men (6.2%) in 2009. The highest prevalence of coronary disease was found in people aged 75 and older (15.3%). The prevalence of stroke in 2009 was similar in men and women (1.8%), and higher among people in the 65–74-year age group (5.8%). In 2009, the prevalence of myocardial infarction was 4.1%; it was higher in men than in women (5.0% and 3.3%, respectively), and highest among those aged 75 and older (12.9%) (12).

Malignant Neoplasms

According to the BRFSS, the prevalence of women who had undergone mammography was 64.2% in 2006, increasing to 67.4% in 2009. In men, the prevalence of prostate cancer was 4.1% in 2006 and declined to 3.7% in 2008 (12).

The incidence rate of cancer in 2006 was 232.9 cases per 100,000 population. Prostate cancer (62.3 per 100,000 men), breast cancer (33.9 per 100,000 women), and colorectal cancer (32.8 per 100,000 population) were the three leading malignancies in 2006 (20).

Diabetes

Diabetes is one of the most prevalent diseases in Puerto Rico, and the third leading cause of death. The main risk factors are overweight and obesity, hypertension, physical inactivity, age over 45 years, and a family history of the disease (13).

The prevalence of diabetes in the adult population has been increasing: it was 11.9% in 2006 and 12.8% in 2010. This increase was observed in both sexes, and prevalence was higher among women (13.4%) than men (12.1%), although the difference was not statistically significant (12). This increase followed changes relating to the main risk factors, such as aging of the population, increased prevalence of overweight, obesity, and hypertension, and reductions in physical activity. Accordingly, the prevalence of diabetes will continue to increase unless population-wide lifestyle changes occur (12).

Chronic Respiratory Diseases

According to BRFSS data, the prevalence of asthma in adults was 5.2% in 2008, 7.6% in 2009, and 7.5% in 2010. In 2010, asthma was more prevalent among women (9.2%) than men (5.5%), and most prevalent in the 35–44-year age group (9.3%), followed by the 18–24-year (7.6%) and 45–54-year age groups (7.9%) (12).

Hypertension

The prevalence of hypertension among adults (18 years or older) increased from 32.7% in 2007 to 34.0% in 2009. In 2009, the prevalence was greater among women (34.6%) than men (33.2%), and highest in the 65–74-year age group (65.5%) (12).

Nutritional Diseases

Obesity

The prevalence of overweight and obesity increased from 64.1% in 2006 to 65.2% in 2009.

In 2009, the prevalence of obesity was greater in men (70.7%) than in women (60.3%), and highest in the 45–54-year age group (75.0%). The body mass index (BMI) of obese persons in Puerto Rico ranged between 30 and 99.8, and the prevalence of obesity increased between 2006 and 2009 (from 24.7% to 27.5%). In 2009, 29.3% of men were obese as compared to 25.9% of women. The highest BMI was found in persons aged 45 to 54 (36.6%) (12).

Accidents and Violence

The incidence rate of rape in 2006 was 4.9 per 100,000 women, and the Office of the Women’s Advocate reported that 21 women were murdered by their current or former partners that year (21, 22). The average age of murdered women was 33.8 years, and most were aged 20 to 39 (76.2%). The average age of perpetrators was 41.9, with 47.6% aged 20 to 39 years. In 2007, 16 women were killed by domestic partners, and their average age was 33.9 years (22). The average age of perpetrators in 2007 was 40.6 years; 38.0% were in the 30–39-year age group (23).

The Ombudsman Office for Retired Persons and the Elderly reported that 377 people aged 60 and over were victims of domestic violence in 2010, accounting for 2% of all victims of this form of violence (24).

Mental Disorders

Evaluation of high-risk behaviors among adolescents enrolled in public high schools and colleges in 2005–2007 (25) revealed that the most prevalent mental health problems in this age group were alcohol use and abuse (19.4%), attention deficit disorder (13.1%), and major depressive disorder (11.5%). The prevalence of conduct disorders was 4.8%. The prevalence of major depression was higher among females (14.8%) than males (8.2%), while conduct disorders were more prevalent among males (6.7%) than females (2.9%). The prevalence of alcohol use and abuse was similar in both sexes (21.1%).

Other Health Problems

Oral Health

In 2008, 75.5% of persons aged 18 or older reported having sought dental care in the previous year; this proportion declined to 69.8% in 2010. Women visited the dentist more often (78.5%) than men (72.1%). By age group, young persons aged 18 to 24 (82.5%) and those aged 25 to 34 (80.5%) accounted for the most dental visits in 2008. The prevalence of complete edentulism (due to dental extraction or loss) in the population over 65 years of age was 22.0%. More women had lost all teeth to extraction (25.1%) than men (18.1%) (12).

Risk and Protection Factors

Smoking

In 2010, 7.5% of adults (aged 18 and over) smoked every day. Men smoked more (10.2%) than women (5.1%). The majority of smokers were in the 25–34-year age group (10.3%). Between 2006 and 2010, the prevalence of smoking declined from 12.5% to 11.9%. In 2010, the prevalence of smoking in men (15.9%) was still higher than in women (8.3%). The highest prevalence of smoking was observed in the 35–44 and 45–54 age groups (13.1% and 13.8%, respectively) (12).

Alcoholism

The prevalence of alcohol use or abuse (men aged 18 and older who have five or more drinks and women 18 and older who have four or more drinks of alcohol in a single occasion) declined from 13.8% in 2006 to 12.1% in 2010. In 2010, 19.6% of men and 5.7% of women abused alcohol. The 24- to 34-year age group was the most affected (21.0%). In 2010, the prevalence of chronic alcohol consumption (men who consume two or more drinks and women who consume one or more drinks of alcohol per day) was 3.0%, and was greater in men (5.0%) than in women (1.3%). People in the 25–34-year age group had the

highest rate of chronic alcohol consumption (6.9%) (12).

Illegal Drugs

In 2008, a study conducted with 3,180 people aged 15 to 74 showed that 30.1% of men and 15.9% of women had used illegal or controlled drugs in their lifetime. The 24–34-year age group had the highest rate of drug use for men (42.6%) and women (26.2%) alike. Marijuana was the most commonly used drug (18.5% in both sexes), followed by cocaine (6.9% in both sexes) (25).

Physical Activity

According to the BRFSS, the proportion of people who engage in physical activity declined from 71.9% in 2007 to 67.5% in 2009. This rate was lower among women (63.5%) than men (72.0%). Physical activity was most frequent in the 18–24-year age group (80.3%) (12).

HEALTH POLICIES, THE HEALTH SYSTEM, AND SOCIAL PROTECTION

THE HEALTH SYSTEM'S STEWARDSHIP ROLE

In February 2008, public policy regarding administration of HIV tests in delivery rooms in Puerto Rico came into effect in response to the AIDS statistics observed—32,354 confirmed cases as of December 2007—by the U.S. Centers for Disease Control and Prevention (CDC).

Neisseria meningitidis infection is a severe bacterial infection that can cause bacterial meningitis (meningococcal meningitis) and other localized infections. Starting in October 2008, the advisory committee for pediatric immunization practices recommended routine vaccination of adolescents aged 11 and 12 at risk of acquiring *N. meningitidis*, and a public policy was established for use of the conjugate vaccine against meningococcal meningitis (MCV4).

According to the CDC, infection by the human papillomavirus (HPV) is the most common sexually transmitted disease in the United States, which led to public policy for use of the HPV vaccine. Beginning in October 2008, three doses of the HPV vaccine were routinely administered to adolescents between the ages of 11 and 12.

SOCIAL PROTECTION IN HEALTH

The Curable Catastrophic Illnesses Services Fund, under the Auxiliary Secretariat for Medical and Nursing Services of the Puerto Rico Department of Health, was created pursuant to Law No. 150 of August 1996 (better known as the Puerto Rico Right to Health Act). The Fund is used to defray, totally or partially, the costs of diagnosis, treatment, and supplementary expenses of people affected by diseases for which medical science has demonstrated that potentially lifesaving treatment is available. The beneficiaries of the Fund are people without coverage or only partial coverage of available health insurance plans, including the Puerto Rico Government Health Plan, in the event that the patient or his or her family members lack the economic resources or means to obtain treatment (26).

For fiscal year 2010–2011, the Fund received US\$ 8 million from the Puerto Rico Government and US\$ 2 million from the traditional lottery. Total disbursements to patients amounted to US\$ 12,389,642, of which US\$ 8,108,222 was payment for procedures. In the same fiscal year, 188 new cases were approved and 7 were rejected as not meeting the Fund criteria. The most frequently funded procedures were bone marrow, cornea, liver, and kidney transplant and cochlear implants (26).

HEALTH LEGISLATION

In July 2007, Law No. 85 was adopted, mandating that defibrillators be placed in all municipal establishments and facilities that provide services to the

public. The Secretary of Health was charged with enforcement of the law, and municipalities were empowered to determine the best location for the defibrillators.

Under the provisions of the American Recovery and Reinvestment Act of 2009, the Secretary of Health of Puerto Rico received funding for installing water pumps, expanding distribution lines, and improving water supply systems in several communities, including Caonillas in Utuado, Hatillo, Aibonito, Caimito, Guaynabo, Humacao, Guánica, Barceloneta, and the community of La Jurada.

Several administrative orders have helped establish public health policies in Puerto Rico. Among these are Administrative Order No. 255, to reduce the upward trend of cesarean deliveries and promote vaginal delivery, adopted in December 2008; Order No. 262 of July 2009, mandating that all vaccination providers enter data on vaccinated persons into the Vaccination Registry of the Puerto Rico Department of Health; and Order No. 270 of May 2010, creating the Volunteer Health Services Program for the 2010 Central American and Caribbean Games, held in Mayagüez.

HUMAN RESOURCE DEVELOPMENT POLICIES

In the 2007–2010 period, there were 53,720 active health professionals (physicians and nurses) in Puerto Rico, serving a population of 3,725,789. The majority of active professionals (34.1%) were concentrated in the San Juan metropolitan region, which includes the municipalities of Carolina and San Juan, followed by Ponce with 14.1%. The lowest concentrations were found in Caguas (13.8%), Arecibo (10.7%), Mayagüez (8.2%), and Bayamón (1.6%) (27).

To deal with current human resources challenges, Puerto Rico is working on the establishment of an Observatory of Human Resources in Health, under the auspices of the U.S. Office of Minority Health. The purpose of this observatory is to ascertain disparities between supply and demand of human resources for health (28).

THE HEALTH SERVICES

Under the health services delivery model of the Puerto Rican Government Health Plan, known as *Mi Salud* (My Health), medical and hospital services are contracted with insurers and provided through a primary attending physician (general practitioner, family physician, internist, gynecologist, or pediatrician). The participating insurers of the Government Health Plan are Humana and Triple S. Mental health services are provided by APS Healthcare throughout Puerto Rico. The *Mi Salud* model provides direct access to specialists without need for referral within a network of providers, as well as physical and mental preventive health services and medicines.

Under the managed care model, benefits are provided through health care organizations and their provider networks. Insurers are in charge of managing their provider networks. Each insurer compensates the health care organization based on established rates for each service through monthly payments collected from beneficiaries. Beneficiaries choose to join certain health care organizations which, in turn, are responsible for providing them with services. Providers participating in the health insurance network also provide services to the private section of the insurer. The insurer has to report and document the fees charged by all participating providers, process claims, and generate the payments for provided services (29). According to the Medicaid Office of Puerto Rico, as of July 2011, the Government Health Plan had 1,629,753 beneficiaries. The Office of the Insurance Commissioner of Puerto Rico reported that, as of December 2010, a further 938,721 people were beneficiaries of private health insurance plans (30), and 803,546 beneficiaries were in other categories, including retirees. Based on these data, one can estimate that the uninsured population of Puerto Rico was approximately 350,000 people. These are people who have incomes too high to qualify for the Government Health Plan, but cannot afford a private plan (31).

KNOWLEDGE, TECHNOLOGY, INFORMATION, AND HUMAN RESOURCE MANAGEMENT

A Virtual Health Library has been established for Puerto Rico through the cooperation of the Library of the Medical Sciences Campus of the University of Puerto Rico and the Graduate School of Information Sciences and Technology of the University of Puerto Rico at Río Piedra, and with the support of the Latin American and Caribbean Center on Health Sciences (BIREME).

A technical cooperation agreement between PAHO and the Puerto Rico Department of Health allowed for the development of a geographic information system (GIS) tool for geospatial analysis of epidemiologic data. The aim of this work is to strengthen national epidemiological capacity (including situation analysis, health surveillance, and monitoring and evaluation of disease prevention and health promotion activities); to guide technical cooperation by enhancing the analytical and epidemiological capacity of health managers and of personnel who are in charge of the health decision-making process at PAHO; and, finally, to facilitate the monitoring of inequalities and inequities in health and to assess the impact of population-based interventions.

Technical cooperation enabled training in the SIGEpi software package, which has an epidemiological component developed by PAHO. In 2004, a Division of Geographic Information Systems was created in the Auxiliary Secretariat for Planning and Development, and a variety of projects and analyses were undertaken.

HEALTH AND INTERNATIONAL COOPERATION

Since 1992, when Puerto Rico was granted Associate Membership in PAHO/WHO, international technical cooperation in health has been carried out primarily through the Office of the PAHO/WHO Coordinator in Puerto Rico. Resources come from PAHO/WHO contributions, the Department of

Health, the University of Puerto Rico, and professional organizations such as the Puerto Rico College of Nursing Professionals and the Puerto Rico Academy of Family Physicians.

SYNTHESIS AND PROSPECTS

The aging population constitutes a major health challenge in Puerto Rico. Chronic, noncommunicable diseases are predominant and some of the main risk factors for these conditions, including obesity, are on the rise, and must be tackled in the future. There is a disparity between supply and demand of human resources in health, and the Department of Health is committed to establishing the Observatory of Human Resources in Health with the purpose of bridging this gap.

REFERENCES

1. Elections in Puerto Rico. Senate and House of Representatives Seat Apportionment [Internet]; 2011. Available at <http://www.electionspuertorico.org> Accessed on 25 January 2012.
2. Alameda Lozada JI. *Estamos en el umbral de una recuperación económica?* San Juan: University of Puerto Rico; 2011.
3. Martínez Cuevas R. *Estudios económicos y financieros. El índice de actividad económica del Banco de Fomento* [Internet]; 2011. Available at http://ronaldmartinezcuevas.com/actividad_econ%C3%B3mica_en_pr Accessed on 25 January 2012.
4. United States Census Bureau. *Puerto Rico Community Survey*. Washington, DC: Census Bureau; 2010.
5. United States Environmental Protection Agency [Internet]; 2011. Available at <http://www.epa.gov> Accessed on 25 January 2012.
6. Puerto Rico, Departamento de Salud. *Informe de inspecciones del Programa de Salud Ambiental*. San Juan: Departamento de Salud; 2006–2007.
7. World Bank. *Data by country, Puerto Rico* [Internet]; 2011. Available at: <http://data.worldbank.org/country/puerto-rico> Accessed on 25 January 2012.
8. Puerto Rico, Departamento de Salud. *Informe anual de estadísticas vitales*. San Juan: Department of Health; 2006.
9. Puerto Rico Department of Health. *Puerto Rico Asthma Surveillance Report* [Internet]; 2009. Available at www.salud.gov.pr Accessed on 25 January 2012.
10. Puerto Rico, Instituto de Estadísticas. *Consulta Juvenil VII 2005–2007*. San Juan: Puerto Rico Statistical Institute; 2007.
11. Puerto Rico, Departamento de Salud, División Madres, Niños y Adolescentes; 2010–2011. San Juan: Department of Health; 2011.
12. Puerto Rico, Instituto de Estadísticas. *Sistema de Vigilancia de Factores de Riesgo del Comportamiento*. San Juan: Puerto Rico Statistical Institute; 2010.
13. Puerto Rico, Instituto de Estadísticas. *Nuevas estadísticas de mortalidad*. San Juan: Puerto Rico Statistical Institute; 2010.
14. Puerto Rico, Departamento de Salud. *Vigilancia de dengue, informes semanales (semana 52)* [Internet]; 2011. Available at: <http://www.salud.gov.pr/Datos/VDengue/InfSemanales> Accessed on 25 January 2012.
15. Puerto Rico, Departamento de Salud, Programa de Vigilancia de VIH/SIDA. *Epidemia del VIH en Puerto Rico* [Internet]; 2010. Available at: http://www.gpcpr.org/files/Epi_VIH_feb_2010.pdf Accessed on 25 January 2012.
16. Puerto Rico, Departamento de Salud. *Enfermedades de transmisión sexual 2000 a 2010*. San Juan: Department of Health; 2011.
17. Puerto Rico, Departamento de Salud. *Tasa de incidencia de tuberculosis en Puerto Rico, 2002 a 2006* [Internet]. Available at: <http://www.salud.gov.pr/Programas/ProgramaTuberculosis> Accessed on 25 January 2012.
18. Puerto Rico, Departamento de Salud. *Informe diario para la vigilancia epidemiológica de influenza en Puerto Rico*. San Juan: Department of Health; 2009.

19. Puerto Rico, Departamento de Salud. Investigación epidemiológica de brote de *Klebsiella pneumoniae* multirresistente. San Juan: Department of Health; 2009.
20. Puerto Rico, Departamento de Salud. Registro Central de Cáncer. San Juan: Department of Health; 2006.
21. Puerto Rico, Oficina de la Procuradora de las Mujeres. Asesinatos de mujeres por violencia doméstica. San Juan: Office of the Women's Advocate; 2006.
22. Puerto Rico, Oficina de la Procuradora de las Mujeres. Asesinatos de mujeres por violencia doméstica. San Juan: Office of the Women's Advocate; 2007.
23. Puerto Rico, Departamento de Salud, Centro de Ayuda a Víctimas de Violación. Informe de violencia sexual en Puerto Rico. San Juan: Department of Health; 2007.
24. Puerto Rico, Oficina del Procurador de las Personas Pensionadas y de la Tercera Edad. Informe anual [Internet]; 2010. Available at: <http://www.oppte.pr.gov> Accessed on 25 January 2012.
25. Puerto Rico, Administración de Servicios de Salud Mental y Contra la Adicción. Trastornos de sustancias y uso de servicios en Puerto Rico. Encuesta de Hogares [Internet]; 2008. Available at: <http://www.assmca.gobierno.pr/> Accessed on 25 January 2012.
26. Puerto Rico, Departamento de Salud, Oficina de Fondos para Servicios contra Enfermedades Catastróficas Remediabiles. Informe de Logros 2010–2011. San Juan: Department of Health; 2011.
27. Puerto Rico, Departamento de Salud. Informe de profesionales de la salud trienio 2007 a 2010, undécimo registro. San Juan: Department of Health; 2010.
28. United States Department of Health and Human Services, Office of Minority Health. State Partnership Grant Program to Improve Minority Health. Washington, DC: DHHS; 2010–2011.
29. Puerto Rico, Administración de Seguros de Salud. San Juan: Puerto Rico Health Insurance Administration; 2011.
30. Puerto Rico, Office of the Commissioner of Insurance. Number of Subscribers with Health Insurance. Guaynabo: Office of the Commissioner of Insurance; 2010.
31. Puerto Rico, Departamento de Salud, Oficina de Medicaid. San Juan: Department of Health; 2011.