



**P**uerto Rico is an island in the Caribbean Sea's Greater Antilles. In addition to the main island, it includes Vieques, Culebra, and Mona, as well as several islets. It has an area of 9,105 km<sup>2</sup> and is divided into 78 municipalities, each of which is administered by a mayor and a municipal council. The capital, San Juan, is located on the northern coast.

## GENERAL CONTEXT AND HEALTH DETERMINANTS

In 1952, Puerto Rico became a commonwealth; it has its own system of government with administrative autonomy for internal affairs. It is governed by a republican system and is divided into three branches: the executive, the legislative, and the judicial.

### Social, Political, and Economic Determinants

The educational level among persons 25 years old and older increased between 1990 and 2000, but there are gender differences in school enrollment. In the lowest school grades, males had higher enrollment, primarily in private schools up to grades 9 to 12. After that point, gender differences in enrollment began to reverse, and by the university level, most students were women.

In 2000, three out of every five people had completed some form of higher education, one out of every four (25.4%) had completed a university or high school degree, and 12.2% had attended university without completing it. School attendance increased from 65.5% to 78.3% among those between 16 and 19 years of age.

There have been major changes in the economy. With industrialization, agriculture was outranked as the primary economic sector and, as a result, employment opportunities shifted from rural areas (inland and agricultural areas) to urban and coastal areas. Puerto Rico's development and modernization led to, among other things, increases in the population's income, as well as high rates of unemployment, more families living below the poverty line, minimal changes in income distribution, very expensive housing projects, environmental problems, high crime rates, marked increases in family violence and child abuse, and high teen pregnancy rates.

The gross national product (GNP) was US\$ 50.3 billion in 2004, representing a 6% increase compared with 2003. Per capita income was US\$ 12,965, and the gross domestic product (GDP) was US\$ 78.8 billion, with a real growth rate of 1.9%. The per capita GDP was US\$ 17,700. The breakdown of the GDP per sector was as follows: manufacturing (42.1%); insurance, finances, and properties (17.1%); trade (11.6%); services (9.9%); government (9.6%); transportation and other utilities (6.9%); construction and mining (2.4%); and agriculture (0.3%).

In 2004, the workforce comprised 1.4 million people between 16 and 64 years of age, of which 1.2 million (88.6%) were employed. The distribution per sector was as follows: services (28%); government (21%); trade (21%); manufacturing (11%); construction and mining (7%); finances, insurance, and properties (5%); transportation and other utilities (4%); and agriculture (2%). In 2004, the unemployment rate was 11.4%.

The population's rate of participation in the workforce decreased from 47.3% in 1990 to 40.7% in 2000; this reduction was greater for men (from 58.4% to 48.5%) than for women (from 37.2% to 33.7%). In 2000, one out of every five persons in the workforce was unemployed, and unemployment was higher among women. The southern region (Ponce) had the highest unemployment rate (27%), and the Metropolitan Region had the lowest (14.2%).

In 1990–2000, the number of persons living below the poverty line decreased from 2,057,377 to 1,818,687, and the highest percentage corresponded to persons 0–17 years old (66.8% in 1990 and 58.4% in 2000). Of the total population living below the poverty line, women accounted for 53.3%. Poverty levels decreased among older adults from 57.5% to 44.0%. In 2000, 48.2% of the total population and 44.6% of all families lived below the poverty line, and in 68 of the 78 municipalities, 50% of the population lived below the poverty line. The population with the highest concentration of poverty lives in the center of the island.

The country faces serious environmental problems, due partly to its small territory and accelerated urban growth. The Environmental Quality Board, the Department of Natural Resources, the Solid Waste Authority, and the United States Environmental Protection Agency are responsible for regulating and monitoring environmental protection activities.

Water quality varies. According to 2003 reports from the Environmental Quality Board and the Environmental Protection Agency, approximately 40% of Puerto Rico's bodies of water do not meet quality standards. The quality of surface water is generally poor due to discharged sewage and agricultural and industrial waste. In 2002, the United States Geological Survey and the Environmental Quality Board stated that the main pollutants in surface water were fecal bacteria and volatile organic nutrients and compounds. These pollutants come from treatment plants, agricultural activity, septic tanks, and domestic discharges. Pol-

lution of aquifers is serious in some 19 places, preventing their use for human consumption. Water resources also have been affected by indiscriminate urbanization and the removal of vegetation and topsoil, which has played a role in changing watershed processes.

Air quality meets most of the established parameters, even though the Environmental Protection Agency occasionally fines the Electric Energy Authority for higher sulfur emissions than allowed. A determining factor contributing to air pollution is the excessive use of motor vehicles. In 2005, it was calculated that there were approximately one million motor vehicles in circulation.

### Demographics, Mortality, and Morbidity

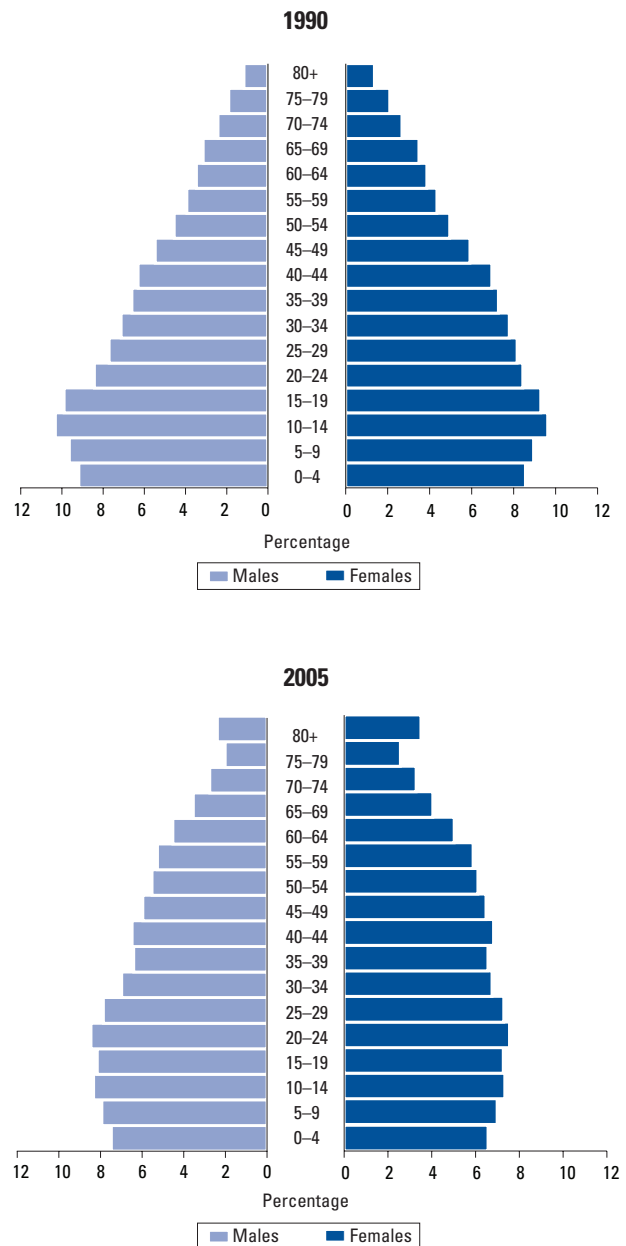
According to the most recent national census, Puerto Rico had a total population of 3,808,610 in 2000, of which 51.9% were women (1,975,033); urban dwellers represented 94% of the population. The male-to-female ratio decreased from 93.9:100 to 92.8:100. Among persons under 15 years old, the male-to-female ratio was 104.9:100; among persons 65 years old and older it was 74.9:100. The average rate of population growth in 1990–2000 was 0.8%, but due to a decreased fertility rate, there was a 23% reduction between 1990 and 2004. The average age of the population increased, meaning that the country had an older age structure. Birth rates have decreased, and life expectancy varied between 76.1 in 2000 and 77.5 in 2004. Figure 1 shows changes in the population structure between 1990 and 2005.

In 2000, population density was 429 persons per km<sup>2</sup>, with 25% of the population residing in six municipalities on the country's northeastern coast. Between 2000 and 2003, life expectancy increased from 72.2 to 73.7 for men and from 79.9 to 81.1 for women; the fertility rate decreased to 1.8 children per woman in 2004. This rate is below the population replacement level (2.1 children per woman), which is largely attributed to the use of permanent contraceptive methods. Professional women have children at a later age and tend to have fewer children.

The population under 15 years old decreased from 958,219 (27.2%) in 1990 to 906,368 (23.8%) in 2000, and the number of persons 65 years old and older increased to 84,900. This trend is linked to changes in birth, mortality, and migration rates, as well as to medical advances and changes in eating habits and lifestyles. The average age for both men and women varied from 28.5 in 1990 to 32.1 in 2000.

Migration flows have increased substantially, and everything indicates that this trend will continue. In 2000, the immigrant population comprised 185,218 permanent residents (0.5% of the population), although some studies put this figure as high as 225,000. The population of non-regular foreign residents was estimated at between 100,000 and 120,000 persons. Outmigration mainly involves young people leaving Puerto Rico in search of new opportunities. Adults, on the other hand, return to the island to spend the later years there.

**FIGURE 1. Population structure, by age and sex, Puerto Rico, 1990 and 2005.**



The general mortality rate increased from 7.3 per 1,000 population in 2003 to 7.5 per 1,000 in 2004, but there was a decrease compared with 1995 (8.3). One factor contributing to these changes was the decrease in the number of deaths due to heart disease (from 162.5 per 100,000 population in 1995 to 129.1 in 2004), the equivalent of a 20.6% reduction. Mortality rates due to AIDS decreased 64%, and remained higher among men. In 2004,

**TABLE 1. Leading causes of death, Puerto Rico, 2004.**

Cause of death	Rank	Number	Percentage	Rate (per 100,000 population)
All causes	—	29,066	100.0	746.1
Heart disease	1	5,031	17.3	129.1
Malignant neoplasms	2	4,829	16.6	124.0
Diabetes mellitus	3	2,569	8.8	66.0
Cerebrovascular diseases	4	1,532	5.3	39.4
Alzheimer's disease	5	1,211	4.2	31.1
Chronic pulmonary disease	6	1,165	4.0	29.9
Hypertensive diseases	7	1,133	3.9	29.1
All accidents	8	1,101	3.8	28.1
Pneumonia and influenza	9	1,030	3.5	26.4
Nephritis and nephrosis	10	832	2.9	21.4
Other causes	—	8,633	29.7	221.6

**Source:** Departamento de Salud, Annual de Estadísticas Vitales; 2004.

the mortality rate in men was 8.6 per 1,000 population and 6.4 per 1,000 in women.

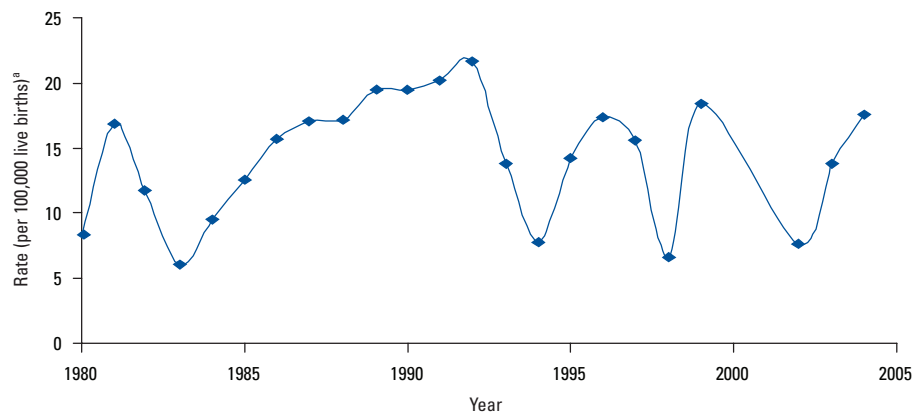
Eight of the 10 leading causes of death (Table 1) were chronic diseases, accounting for nearly two-thirds of the country's deaths. Heart disease, malignant neoplasms, and diabetes have been the three leading causes of death for many years, accounting for nearly half of all deaths (44%). Even though heart disease remained the leading cause of death, it showed a downward trend, topping malignant neoplasms by approximately 1%. Mortality from AIDS has been largely reduced, and this cause now ranks as the 13th leading cause of death after being among the top ten for much of the 1990s. Mortality from septicemia also has considerably decreased in recent years. Accidents and murders remained among the twelve leading causes in 2001–2005, primarily affecting persons 15–19 years old.

The maternal mortality rate for 1991–2003 was 14.5 per 100,000 live births; in 2004, it was 17.6 per 100,000 (Figure 2), even though

the Department of Health's Division of Mothers, Children, and Adolescents states that cases may have been underreported. The 2002–2003 Descriptive Study on Maternal Mortality in Puerto Rico recorded 22 pregnancy-related deaths, while the Vital Statistics Report recorded only 11.

Data supplied by the Health Insurance Administration show that the primary diagnoses of the population covered by the Commonwealth's health insurance were hypertension (19.6%), diabetes mellitus (14%), and asthma (12%). These diseases represented 46.3% of the demand for service. In terms of morbidity by sex, there was a greater prevalence of hypertension (22.1%), diabetes (15.9%), anxiety (5.1%), asthma (13.2%), and depression (6.5%) among women, while the prevalence of schizophrenia (2.1%) was slightly higher among men. The prevalence of asthma is higher among the younger population, with those under 18 years old and young adults 18–24 years old being the most affected. The prevalence of diabetes is highest among per-

**FIGURE 2. Maternal mortality rates, Puerto Rico, 1980–2004.**



sons 55–64 years old, and hypertension is most prevalent among persons 65–74 years old. The prevalence of heart disease, cerebrovascular events, and congestive heart failure is highest among persons older than 75 years old. The frequency of mental disorders, specifically anxiety, depression, and schizophrenia, increases with age; the highest prevalence is found among 45–54-year-olds, decreasing among persons older than 74 years old. Most medical consultations were for hypertension and diabetes, cardiovascular events, and mental disorders; most emergency room visits were for asthma and diabetes. Coronary disease and cerebrovascular events were the reason for the greatest number of hospital admissions; diabetes was responsible for the highest number of laboratory services.

In 2000–2003, the highest rates of enteric diseases subject to mandatory reporting corresponded to salmonellosis, hepatitis A, shigellosis, campylobacteriosis, and giardiasis. Category II diseases with the highest incidence rates were grippal syndromes and influenza, gastroenteritis, conjunctivitis, and meningitis. Morbidity rates for diseases subject to mandatory reporting have remained at expected levels, except during outbreak years. In 2003, there was an outbreak of conjunctivitis in the entire country with 1,438 cases, and in 2004 there was an outbreak of aseptic meningitis, with a rate of 25.2 per 100,000 population. As of 2005, there had been no reported cases of West Nile virus in humans, even though it was identified in four animals in February 2004.

## HEALTH OF POPULATION GROUPS

### Children under 5 Years Old

The infant mortality rate decreased from 13.4 per 1,000 live births in 1990 to 8.1 per 1,000 live births in 2004. Neonatal mortality and postneonatal mortality also decreased. Approximately 50% of infant deaths occurred during the first 7 days of life (Figure 3).

In 2004, the five leading causes of infant mortality were short gestation and low birthweight, congenital malformations, respiratory problems originating in the perinatal period, other perinatal conditions and diseases, and circulatory system diseases. The three leading causes of neonatal mortality were short gestation and low birthweight, sepsis, and respiratory problems originating in the perinatal period. The three leading causes of postneonatal mortality were congenital deformations, septicemia, and diseases of the circulatory system.

An evaluation of the distribution of infant and fetal deaths that considered age at death and birthweight, as well as a calculation of excess mortality according to the categories of maternal health, maternal care during pregnancy, and newborn and infant care, determined that the decrease in infant deaths was largely due to technological advances in the neonatal intensive care

rooms, rather than to improvements in the mother's health during pregnancy or to prenatal care. WHO's Perinatal Periods of Risk model was used to evaluate the indicators.

The most important of the variables associated with infant mortality was low birthweight. Seven out of every ten deaths (73.4%) in 2001 occurred in children with low birthweight, and 50% of all infant deaths occurred among children who weighed less than 1.5 kg. Approximately 1 out of every 10 infant deaths were to adolescent mothers.

According to a paired case-control study carried out between 2000 and 2003 by the Department of Health's Division of Mothers, Children, and Adolescents, the number of children with low birthweight increased from 10.8% in 2000 to 11.5% in 2003. The major factors that contributed to this were preeclampsia, a weight increase of fewer than 20 pounds or of more than 30, obesity, vaginal bleeding during the first trimester, having had fewer than eight prenatal visits, and suicide attempts during pregnancy.

### Adolescents 10–14 and 15–19 Years Old

According to the 2000 census, there were 619,236 adolescents (17% of the population), of which 49,339 were enrolled in the Commonwealth's Health Plan.

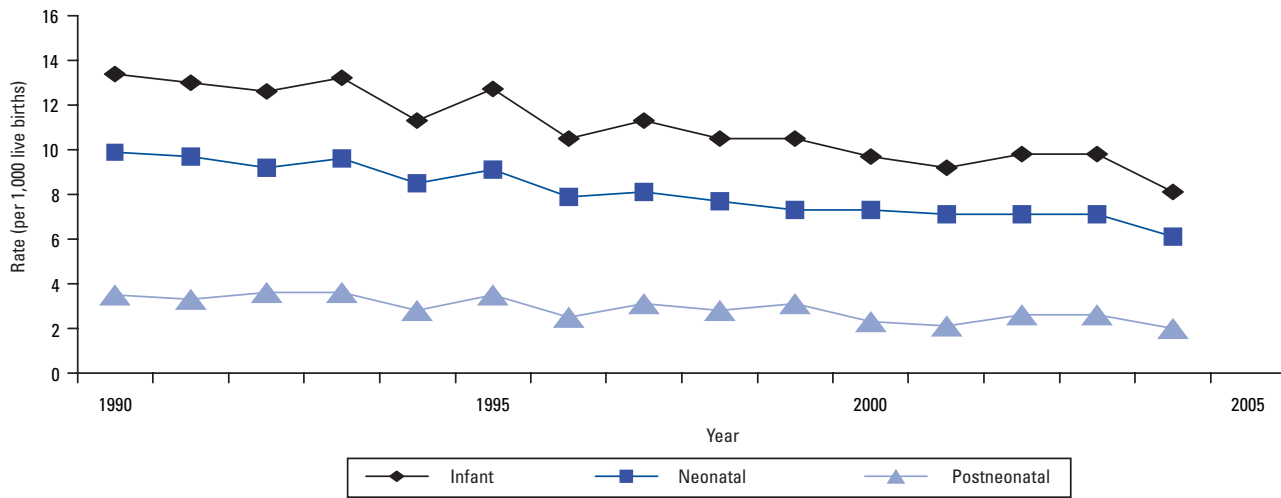
A study by the Mental Health and Anti-Addiction Services Administration carried out in 2000–2002 and involving 426,038 Puerto Rican private- and public-school students from the fifth to twelfth grades showed that the most frequently used drugs, at least once, among adolescents in the fifth and sixth grades were alcohol (34.4%), cigarettes (6.1%), and inhalants (2.7%). Among adolescents between the seventh and ninth grades, the most used drugs were alcohol (43.6%) and cigarettes (15.5%). A total of 6.8% indicated that they had consumed illegal drugs. The drugs most commonly used by adolescents between the tenth and twelfth grades were alcohol (76.2%) and cigarettes (40.4%). A total of 20.6% stated that they had consumed some illegal drug, with marijuana (18.9%) and designer drugs (3.8%) being the most frequently used (1).

It is difficult to estimate the total number of adolescent pregnancies because there is no reliable record of the abortions performed each year. Data available from clinics on pregnancy termination in fiscal years 2002/2003 and 2003/2004 show that of the 14,593 induced abortions, 4,166 (29%) were performed on mothers 15–19 years old. Birth rates among adolescent mothers 10–19 years old have decreased, from 42.9 per 1,000 in 1997 to 31.4 per 1,000 in 2004.

### Older Adults 60 Years Old and Older

The proportion of persons older than 60 years old increased from 13.2% in 1990 to 15.4% in 2000. The rate of growth of the population of 60-year-olds has been higher than that of the pop-

**FIGURE 3. Infant, neonatal, and postneonatal mortality rates, Puerto Rico, 1990–2004.**



Source: Departamento de Salud, Informe Anual de Estadísticas Vitales, 1990–2004.

ulation as a whole. According to data from the Health Conditions of Older Adults in Puerto Rico, during 2002–2003 the prevalence of hypertension, arthritis, obesity, diabetes, incontinence, and depression was greater among older adults and higher among women than men in this group.

### Workers

Musculoskeletal conditions gave rise to most of the cases of occupational diseases in the last decade. In the private sector, injuries due to repetitive motion caused the highest number of workdays lost (35–45 days, on average). In 2001, the public sector reported 31 workdays lost due to repetitive motion. The Government Insurance Fund, the body responsible for providing health care, reported that the injuries responsible for the most number of cases were back contusions and injuries, with figures varying between 12,000 and 15,000 annually.

### Persons with Disabilities

The 2000 census included two questions specifically directed to persons with disabilities: one dealing with sensory and physical disabilities and the second with mental disabilities, limitations on activities of daily living, and employability. There were 934,674 persons older than 5 years old who had some disability, representing 26.8% of the total population—6.9% of those 5–15 years old, 26.8% of those 16–64 years old, and 59.1% of persons 65 years old and older had some form of disability.

According to the 2002 Behavioral Risk Factor Surveillance System survey, 14.9% of those interviewed stated that they had some

type of limitation. Women reported more limitations (15.8%) than men (13.9%). The most common health problems among people with some form of limitation were back problems (18.2%), followed by emotional problems, depression, and anxiety (13%).

According to data from the 2001 Ongoing Health Study, chronic conditions were the most prevalent among the disabling conditions studied (1,897 per 10,000), followed by physical disabilities (264 per 10,000), mental disorders (253 per 10,000), conditions associated with developmental deficiencies (98 per 10,000), and severe injuries (41 per 10,000).

## HEALTH CONDITIONS AND PROBLEMS

### COMMUNICABLE DISEASES

#### Vector-borne Diseases

According to data from the Environmental Health Division and the Epidemiology Program of the Department of Health, during 2001–2005, there were a significant number of suspected cases and deaths due to **dengue**: 5,233 suspected cases and one death in 2001; 2,906 suspected cases and no deaths in 2002; 3,735 suspected cases and one death in 2003; 3,289 suspected cases and one death in 2004; and 5,775 suspected cases in 2005 (no data available on deaths).

#### Vaccine-preventable Diseases

The incidence of cases due to these diseases decreased notably; the highest number was recorded in people 60 years old and older who had not completed their vaccination series.



In 2001, there were three cases of **rubella**, one of **parotiditis**, and one of **meningitis**; in 2002, there were three cases of **tetanus** (who died), two of **rubella**, two of **mumps**, and two of **meningitis**. Between 2003 and 2005, one case of **whooping cough**, four cases of **tetanus**, nine of **meningitis**, and one of **rubella** were recorded. There were a significant number of cases of **hepatitis A**: 258 cases in 2001, 242 in 2002, 104 in 2003, 65 in 2004, and 66 in 2005. The number of **hepatitis B** cases was: 297 in 2001, 221 in 2002, 145 in 2003, 88 in 2004, and 63 in 2005. The number of reported cases of **chicken pox** was 2,186 in 2001; 1,141 in 2002; 652 in 2003; 445 in 2004; and 779 in 2005. There were no reported cases of **diphtheria** or **polio**.

### Chronic Communicable Diseases

The incidence of **tuberculosis** increased from 121 cases per 100,000 inhabitants in 2001 to 129 cases per 100,000 in 2002. In 2003, the incidence of tuberculosis was 115 per 100,000 inhabitants; in 2004, 123 per 100,000; and in 2005, 113 per 100,000. Incidence was greater among men (70% of cases). Persons 15–44 years old were the most affected.

### HIV/AIDS and Other Sexually Transmitted Infections

In 2002, Puerto Rico had the seventh highest incidence rate for AIDS cases in the United States and its territories. In 1990–2002, there were 28,701 accumulated AIDS cases reported. Men were the most affected (76.4% of the cases reported). Most cases were diagnosed among persons 30–39 years old (43.4%), and this distribution was the same for men and women. There were 18,154 reported deaths up to 2004, and from that year forward the number of AIDS deaths decreased. AIDS-related deaths were the 23rd leading cause of death between 2000 and 2004.

Use of intravenous drugs (50.2%) and unprotected heterosexual contact (24.3%) were the most prevalent HIV transmission modes; 16.6% of cases were among men who have sex with other men.

Up to 2002, the number of pediatric AIDS cases rose to 404, with mother-to-child HIV transmission being responsible for exposure in 94.8% of pediatric cases. No cases of pediatric AIDS were reported in 2003–2004.

**Chlamydia** infection has been the sexually transmitted disease with the highest incidence in recent years, with a rate of 72.1 per 100,000 population in 2003; the greatest number of cases were found in women. **Gonorrhea** has been declining, but this could be the result of underreporting, because in recent years a technique has been used that does not allow for taking cultures from certain areas of the body.

Rates of primary and secondary **syphilis**, which include early latent and late latent syphilis, increased from 6.4 per 100,000 population in 2001 to 7.0 in 2002, decreasing to 5.2 per 100,000 in 2003 and to 4.7 in 2004. In 2005, the rates of primary and secondary syphilis increased to 5.8. The disease affects men more,

and the age groups most affected were persons 20–24 years old and 30–34 years old.

### Zoonoses

The Surveillance System reported 98 cases of **animal rabies** in 2001, 87 in 2002, 71 in 2003, 61 in 2004, and 71 in 2005. Cases were reported in mongooses, cats, dogs, horses, and cows, in descending order.

## NONCOMMUNICABLE DISEASES

### Metabolic and Nutritional Diseases

**Diabetes** has been the third leading cause of death for the last 15 years, with rates steadily increasing in the period. Between 2001 and 2004, the diabetes mortality rate increased 5.6% (from 62.5 per 100,000 population to 66.0 in 2004). In 2004, about 1 of every 10 deaths was caused by diabetes. Diabetes deaths increase with age, and the highest rates were among those over 85 years old. In 2004, the mortality rate due to diabetes was 68.8 per 100,000 in men and 63.3 per 100,000 in women.

Some 19.3% of the population follows some form of diet, and women are more likely to do so. Data for 2002 from the Behavioral Risk Factor Surveillance System (BRFSS) showed that 14.5% of the population reported that they consumed five or more fruits and vegetables per day, 10.2% reported that they consumed little or no fruits and vegetables, and 44.7% reported that they consumed one or two portions.

BRFSS data showed that in 2002 nearly 61.6% of persons interviewed were **overweight**. A report from the Women, Infants, and Children (WIC) Program showed that among children 3–5 years old who participated in the Head Start Program, 7.7% were classified as obese.

Overweight and obesity were also major risk factors among older adults. According to the Puerto Rican Elderly Health Conditions report, 33% of women and 27% of men 60 years old or older had a body mass index (BMI) of 30 or more in 2002–2003. According to BRFSS, 49.2% of older adults stated that they did not exercise at all in their free time in 2001; 46.9% did so in 2002.

### Cardiovascular Diseases

Deaths due to cardiovascular diseases were mostly recorded among people 65 years old and older. Considering the distribution of deaths due to heart disease with the aging of the population, it would be expected that the number of cardiovascular deaths would remain equal or increase. Instead deaths due to cardiovascular disease decreased between 1999 and 2004.

### Malignant Neoplasms

Malignant neoplasms are getting to be the leading cause of death, after having ranked second in 1999. Neoplasms in diges-

## Streamlining the Health System and Reaching Out to Vulnerable Groups

Fueled by the Government's reform processes, Puerto Rico's health system has undergone far-reaching changes designed to improve performance and granting the state government the leadership role for the health sector. To improve access to services and extend their reach, the Government of Puerto Rico has embraced as a priority the development of systems to provide support to vulnerable groups such as women, young people, women who are heads of households, children, and retirees. To this end, it has engaged in various health promotion and protection initiatives. In addition, the Government is carrying out a disease prevention public policy and reformulating the health policy that sets the Department of Health's functions. Administrative Order 179, issued on 15 January 2003, is the most recent mechanism for reorganizing the Department by streamlining its structure, better coordinating related activities, reducing duplication and overlap, bolstering coordination, establishing lines of supervision, and establishing frameworks for activities or intervention.

tive organs were the leading cause of death, accounting for 31.8% of total deaths; followed by prostate neoplasms (10.3%); neoplasms in lymphatic, hematopoietic, and related tissues (9.0%); and breast neoplasms (8.4%). Breast and prostate neoplasms have increased considerably since 1990. The highest numbers for malignant neoplasms were recorded among persons 60 years old and older. Among women, malignant neoplasms of the breast accounted for nearly one-third of malignant neoplasms, followed by colorectal and cervical neoplasms. Among men, prostate, lung, and colorectal neoplasms ranked highest.

### OTHER HEALTH PROBLEMS OR ISSUES

#### Mental Health

Prevalence rates of severe mental disorders in adults and severe emotional disturbance in children and adolescents were estimated using the standards set by the Center for Mental Health Services. At least two of the following criteria (2) must be met for a mental illness to be classified as severe: have a psychiatric diagnosis as defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) (3); have a score of 5 on the subscales of the Psychiatric Symptoms and Dysfunctional Scales; and have a score of 23 or more on the subscales of the Center for Epidemiological Studies Depression Scale.

In 2000, the prevalence rate of severe mental diseases among the population older than 18 years old was approximately 8.3% (225,470). This estimate coincided with figures from a study on the patterns of use of mental health services (4). The last epidemiological study of the population of children and adolescents 4–17 years old showed that nearly 140,528 children and adolescents meet the criteria for mental disorders in the DSM-IV-TR,

with slight to moderate impediments, and nearly 59,125 meet the criteria for severe emotional disturbance (5).

In fiscal year 2003, some 32,521 children were treated through the Health Reform in the Area of Mental Health and the Mental Health and Anti-Addiction Services Administration. Of these, it is estimated that 50% (16,260) met the criteria for severe emotional disorders (6–9). Some 42,865 (72.5%) of the 59,125 children and adolescents with a severe mental condition and severe disability did not receive mental health care. It was estimated that nearly 51,016 persons 65 years old or older suffer from some defined psychiatric problem and that between 64,000 and 106,000 older persons could have a major mental health problem.

#### Addictions

According to data from the 2002 Ongoing Health Study, 29.9% of persons older than 17 years old had smoked at some point; 14.7% continued to smoke, with greater prevalence among men (21.3%) than women (9.6%); 62% of regular smokers stated that they intended to quit.

According to the Ongoing Health Study, approximately 16% of those older than 17 years old had consumed five or more drinks per day in 2002. Men tended to have consumed three and a half times more alcohol than women.

#### Oral Health

BRFSS data for 2002 showed that nearly 75% of the population visited a dentist or dental clinic within the year prior to the interview; 21.7% of the population stated that they had lost six teeth or more due to cavities or periodontal disease. According to PREHCO data, more than 40% of adults older than 60 years had lost most or all of their teeth; 60.4% of the elderly had bridges or dentures, and 93.3% used them.



## RESPONSE OF THE HEALTH SECTOR

### Health Policies and Plans

The Government's reform processes have brought about major changes in the health system over the last decade. The Government was given the steering role in the health sector, and it has made major efforts to increase access to health services, control costs, and improve user satisfaction, as well as to pay greater attention to health promotion and the prevention and control of diseases.

The Department of Health was reorganized through Administrative Order 179 (15 January 2003) in order to streamline the organizational structure, improve the coordination of related operations, facilitate coordination of activities, establish lines of supervision, and define frameworks for action or intervention.

Between 1994 and 2000, the Government sold most of the health service infrastructure to private investors and contracted out the health insurance of the indigent population. Puerto Rico was divided into 10 health regions, and public health centers were privatized. The 10 health regions were incorporated into the Health Reform (Commonwealth Plan) and beginning in 2002 were restructured into eight regions: North, Northeast, Metro-North, East, Southeast, West, Southwest, and San Juan.

The privatization of health services produced negative effects, including a lack of comprehensive coordination in multiple institutions; competition between general hospitals for patients and for reimbursements by insurers; duplication of services at all levels of service provision; limitation of endovascular neurosurgery services; division of physical and vocational rehabilitation services and limited access to psychiatric services, both in hospitals and in intensive ambulatory care and care in distant facilities; lack of traditional psychiatric rehabilitation services for long-term care patients; lack of comprehensive psychiatric services in general and specialized hospitals; need for telemedicine services for the entire island, which currently operate only in a limited basis in Vieques; and a lack of coordination in the provision of services.

### Health Strategies and Programs

In its effort to improve access and expand the provision of services, the Government offers educational opportunities and implements support systems for women, female heads of household, young people, children, and retirees. Various initiatives and projects are being carried out to promote and protect health. In addition, a public policy has been established to prevent diseases, and the Department of Health's health policy, which is part of its steering role, is being recast.

In order to improve health services for the medically indigent population, achieve greater efficiency, and improve price and quality, "controlled competition" was established. Those eligible

for this first stage were persons living up to a 200% level of poverty. Poverty level was calculated as US\$ 401 for a one-person family, with US\$ 95 added for each additional person. Coverage was provided to families with monthly incomes up to US\$ 791 and low deductibles were set. The deductibles would not be applicable for people with a 50% level of medical indigence. Complete coverage is offered through insurers to individuals with a 200% level of medical indigence.

### Organization of the Health System

Health services include public facilities, privatized public facilities, and private facilities, all of which are duly accredited by the Department of Health's Deputy Secretariat of Standardization and Accreditation.

The Health Insurance Administration (a public corporation with an independent legal status and separate from any other Government entity, agency, department, or instrument) is responsible for negotiating and contracting quality health insurance for eligible residents regardless of their economic situation. The Administration was charged with ensuring the right to choose among several insurance companies working in the region. It cannot do so, however; as a result of the current situation's complexity, there is only one insurer operating in each region.

The Government, through the Health Insurance Administration, offers health plans such as the Basic Coverage Plan, the Special Coverage Plan, and the Mental Health Coverage Plan, health plans that must provide quality medical and hospital services, regardless of a person's capability to pay for them.

The Basic Coverage Plan includes preventive, surgical, hospitalization, maternity, outpatient, and emergency-room rehabilitation services, as well as diagnostic tests; dental care; sea, air, and land ambulances; drugs; and others.

The Special Coverage Plan offers intensive care services, cardiovascular and neurosurgery procedures; peritoneal dialysis treatments; hemodialysis and related services; intensive neonatal care; malignant neoplasm treatments; diagnostic tests that include tomography and magnetic resonance imagery; and other services. Services are offered through the network of participating providers, who have contractual arrangements with insurers throughout the island. The Plan also includes services for the medically indigent recipients of Medicare, which have been approved by the Medicaid program.

The Mental Health Coverage Plan includes medical exams and the evaluation and treatment of mental illnesses; ambulatory psychiatric and psychological services; partial hospitalization; stabilization, detoxification, and medication; and ambulance services.

The Catastrophic Coverage Plan includes treatment for AIDS, leprosy, and substance abuse, as well as the implantation of pacemakers, valves, and artificial heart equipment. As a rule, insurers prefer to disburse special coverage expenses to retain greater

**TABLE 2. Persons treated through the Reform’s mental health area, Puerto Rico, 2000–2003.**

Year	Number of patients	Number of insured	Percentage of access or use
2000	125,238	1,795,067	7.0
2001	125,511	1,730,623	7.3
2002	146,584	1,623,169	9.0
2003*	136,937	1,521,848	9.0

*Source:* Administración de Servicios de Salud. Database, March 2004.

control over catastrophic conditions because these services are very expensive.

According to data from the Office of the Insurance Commissioner, 3,154,582 people had some health insurance plan in 2003, but this figure could double because some persons may have enrolled in health insurance plans with more than one insurance company, because of differences in the type of medical insurance, or because of how the information was gathered.

In 2003, 40% of the population was covered under the Commonwealth Medical Plan, 14% received medical care through Medicare, 37% had some form of private insurance, and 8% had no medical plan.

Health reforms in mental health have enabled services to be provided to approximately 1.5 million persons, even though service utilization is extremely low when compared to the magnitude of the country’s problem (Table 2).

### Public Health Services

The law requires that children be vaccinated before being enrolled in school. Thanks to this requirement, annual coverage levels among the student population (which is currently 726,511 students) is between 80% and 87%, meaning that 8 out of every 10 students have up-to-date vaccinations. The Health Department provides vaccines against influenza, pneumonia, and tetanus/diphtheria for the medically indigent and at-risk populations, which has taken coverage above 90% as a rule. May 2001 marked the beginning of a shortage of the diphtheria, tetanus, and whooping cough (DTaP) vaccine, which caused a decrease in coverage from 94.1% to 31% in 2002.

In 2002, a surveillance system was developed to combat West Nile virus, and work was being carried out on the design and implementation of a health database (DATAWAREHOUSE) that will provide a sophisticated system for capturing events and that includes appropriate and reliable information for strategic planning and for measuring health results.

In 2000, 99% of the population had a home connection to potable water. In 2005, the Aqueducts and Sewer Authority provided services to 1,174,000 residential clients (93.1% of homes). Several communities have established their own potable water

system and, according to the Department of Health’s Division of Potable Water, have provided services to some 2% of homes. The Aqueducts and Sewer Authority reported that 678,000 homes (54%) were connected to the sewerage system. Water supply in urban areas is uninterrupted throughout the day; all water systems are disinfected through treatment plants.

Waste is mainly disposed of in landfills, which has created a critical problem. According to data from the Solid Waste Authority, five million tons of waste are generated annually and, of those, nearly 2,600,000 are household waste (1.8 kg per person per day). Most of this waste is processed in municipal dumps; only 15% is recycled.

### Individual Care Services

There were 68 hospitals in fiscal year 2001–2002, 12 of which belonged to the public sector, and 56 to the private sector. In terms of distribution, 37% (25) of the hospitals were in the Metropolitan Region; 16% (11), in the Ponce region; 13% (9), in Arecibo, Caguas, and Mayagüez; and only 7% (5) in Bayamón. The Metropolitan Region had the highest proportion of hospitals per population (1 per 40,420), while Bayamón had the lowest, at 1 per 120,144 population.

The distribution of available beds per 1,000 population also varied significantly. The national average was 3.3 beds per 1,000 population, but the Metropolitan Region accounted for 41% of the 12,562 beds, with a rate of 5.0 beds per 1,000 population; Ponce, for 16%, with a rate of 3.3; Caguas, for 12%, with a rate of 2.7; Bayamón, for 13%, with a rate of 2.6; Mayagüez, for 11%, with a rate of 2.5; and Arecibo, for 7.5%, with a rate of 2.0.

### Human Resources

According to the registry of health professionals, there were 54,120 active professionals in 2001–2004 (38.8% were concentrated in the Metropolitan Region): 8,225 physicians, 24,777 nurses, 2,779 medical technicians, 2,428 pharmacists, 1,457 dentists, and 14,454 other professionals. Of the total health professionals, 75.2% of physicians and 70.9% of other health professionals worked in the private sector; the rest worked in the public sector or in volunteer work (24.5% and 0.3%, respectively). There were 30.2% working as general practitioners; 11.8% worked in internal medicine; 10.7%, in pediatrics; and 47.3%, in specialties, including obstetrics and gynecology, family medicine, general surgery, and anesthesiology.

Primary centers were staffed by primary medicine physicians, such as family physicians, internists, pediatricians, obstetrician-gynecologists, and general practitioners; they also had the support of other physicians depending on morbidity and mortality patterns in the area. In addition, they may have the support of dentists, optometrists, clinical laboratories, x-rays, and pharmacies.

**TABLE 3. Health Plan budget, Puerto Rico, fiscal year 2002–2003.**

Source	Amount (US\$)	Percentage
Medicaid	189,000,000	14.8
Health Insurance Program for Children	26,000,000	2.0
Municipalities	136,000,000	10.6
General Fund	931,000,000	72.6
Total	1,282,000,000	100.0

*Source:* Departamento de Salud de Puerto Rico, Administración de Seguros de Salud.

### Research and Technological Development in Health

One of the most important aspects of the health system is the investment in the automatization and technological development of health processes and services. Both the public and private sectors have major technological resources at their disposal. In recent years, the Government has invested approximately US\$ 300 million to purchase highly sophisticated diagnostic and treatment equipment, as well as the most advanced and secure information and data processing technology, which it has made available to patients. The vast majority of these resources are concentrated at the central level (Metropolitan Region); other health regions scarcely have basic resources such as printers, photocopiers, personal computers, Internet access, and others.

### Health Sector Expenditures and Financing

In Puerto Rico, the flow of funds between sources and agents is channeled through public financing, payment of public or private insurance premiums, and user fees or quotas. The flow of funds between agents and providers is channeled via different payment mechanisms, including budgets, fees for services, and training. In 1999–2003, the health sector held one of the most important positions in the country's economy, with spending increasing from US\$ 10.1 billion to US\$ 12.2 billion. This increase was reflected both in the amount of resources used by the health sector and in the increase of the prices for said resources. The public sector was an extremely important component in the provision and financing of health services. In 1994–1995, financing of the health card amounted to US\$ 82.3 million. The health sector represented 16.4% of the GDP for fiscal year 2003. Annual per capita health spending was US\$ 3,143 in current prices for fiscal year 2003, which represented an increase of US\$ 466 in per capita spending compared with 1999. Table 3 shows the breakdown of the Health Plan budget for fiscal year 2002/2003.

Before the Reform, the Government offered health services through the corresponding agencies (the Health Facilities and Services Administration and the Department of Health). All of

these services were considered central government expenses. After the Health Plan, these expenses were considered part of the private sector. The Government paid the insuring company a premium so that people who were members of the Plan would receive a health card and be able to receive medical services and medicines. The premium payment was considered as a transfer payment to individuals, becoming part of their personal income. As a result, people's consumption spending increased for medical services, medicines, and other related expenses. As the Health Plan has been progressively implemented, the Government's consumption spending has decreased and income and spending for personal consumption have increased. Health reforms have resulted in a system that has exceeded 20% of the gross domestic product in health care expenses, even though quality is questionable, and both subscribers and providers are dissatisfied.

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