

# MONTSERRAT



**M**ontserrat, one of the Leeward Islands in the Eastern Caribbean, lies roughly 40 km southwest of Antigua. Montserrat is an island of volcanic origin; its topography is dominated by three mountainous regions—Silver Hills, Center Hills, and Soufriere Hills—surrounded by a small coastal lowland belt.

## GENERAL CONTEXT AND HEALTH DETERMINANTS

The island's vegetation ranges from lush tropical forest at higher elevations to dry grasslands in some coastal areas. The terrain has hot springs, ravines, black sand beaches, and one white sand beach in the north. The country is well watered with several natural springs. The climate is tropical, usually tempered by sea breezes. Yearly rainfall averages 1,475 mm, with most rain falling in the second half of the year. June to November is the hurricane season.

Montserrat is a British overseas territory with its own system of government. The Executive Council consists of a Chief Minister, three other elected Ministers, a Governor who represents the Queen, an Attorney General, and a Finance Secretary. There also is an 11-seat Legislative Council, 9 of whose members are popularly elected.

Most residents are of African descent. The dominant religious denominations were Anglican (21.8%), Methodist (17%), Pentecostal (14.1%), Roman Catholic (11.6%), and Seventh Day Adventist (10.6%), and the remainder were Church of God, Hindu, Rastafarian, and unspecified. Standard English is the official language but a Montserrat Creole English is most widely spoken on a daily basis.

Montserrat's Gerald's Airport provides regular inter-island services to and from V.C. Bird International airport in Antigua, a connecting hub to other destinations. The unit of currency is the Eastern Caribbean dollar (EC\$) pegged at EC\$ 2.70 to US\$ 1.

Montserrat's Soufriere Hills Volcano became active on July 18, 1995. The volcano's subsequent eruptive activity in the late 1990s and the more recent ventings of ash and pyroclastic flows have been at the center of life for the island's residents. More than half of the 12,000 inhabitants left the island after the eruption in 2000.

In early August 2005, a new lava dome grew in the Soufriere volcanic crater, following a period of vigorous ash emission and explosions that began in June of that year. This was the first lava extrusion in two years following the giant collapse of the previous dome in July of 2003. The 1998–2002 Sustainable Development Plan indicated that, based on public consultations and a policy discussion, the future of Montserrat is dependent upon developing the north of the island.

The loss of Plymouth and the other major urban and agricultural areas in Montserrat's south was a key factor affecting the territory's economy. The evacuation associated with the volcano was one of the primary causes of the loss of assets. There is a one in four chance of continued magmatic activity for the next 30 years. Under these conditions, the area north of Lawyers Mountain line is safe from all but the most severe volcanic activity and so is suitable for all forms of development. Continued damage assessment was carried out to determine the true losses from volcanic activities. In the reporting period, sections of the north were developed and this area continued to absorb substantial levels of development without long-term damage to the environment.

The volcanic crisis had a particularly dramatic impact on the private sector. Not only did large inward investors leave the island, but assets were destroyed and local markets which supported small and medium enterprises became fragmented. Many businesses fell into debt and key subsectors that had been targeted for development before the crisis, such as tourism, information technology, and export oriented light manufacturing, were decimated (1).

The Soufriere Hills Volcano continued to have intermittent eruptions, sometimes depositing large amounts of ash in inhabited areas, resulting in disruption in the schools and people's livelihood.

## Social, Political, and Economic Determinants

The volcanic crisis has been an ongoing source of vulnerability, dependency, and poverty in Montserrat. In response to the 1998–2002 Sustainable Development Plan's objective seeking protection through social welfare, the Government of Montserrat undertook the development of a comprehensive and integrated welfare system that would provide a safety net for vulnerable groups, thus responding to their immediate needs. The Plan superseded the crisis food voucher payments that were part of the public assistance program before the eruption. Instead, a means tested social welfare system that has been in place since 2000 provides a basic allowance for food. In addition, since 2001 the Government has provided a rental subsidy for vulnerable government housing tenants. The main beneficiaries of this program

were the elderly and the mentally and physically disabled, who had no other means of support.

Since the Soufriere Hills Volcano eruption, tourism dwindled to mostly one-day visits from Antigua and Nevis. Data show the number of arrivals of day-trippers and overnight guests increased by 11% in 2000, compared to 1999; there also was a subsequent increase of 9% in 2001. In 2002, there were 12,400 visitor arrivals, representing a 10% decrease from the 13,700 recorded in 2001. This drop was largely attributable to the extension of the Volcano Exclusion Zone, which made many villas and the Vue Pointe Hotel inaccessible.

In 2004, the GDP at factor cost was US\$ 35.0 million, compared to US\$ 30.6 million in 2001. GDP at market prices for 2004 was US\$ 41.0 million, compared to US\$ 34.7 million in 2001. The rate of inflation for 2002 was 3.5%.

The majority of persons who participated in a 2002 poverty assessment survey agreed that there was poverty in Montserrat, even if it affected only a few persons (2). Several groups were identified as possibly at risk—single households headed by women who had no support, the elderly (especially without family support), the mentally challenged who are unable to look after themselves, teenage girls needing help, and potentially disaffected male youths who either underachieve at school or leave school without finishing.

The above-mentioned survey established a ranking for people facing difficulties on the island—definitely not making it (scrumting), possibly not making it (scraping through), barely making it (down but not out), making out (but stretched), and making it (doing okay). The matrix illustrated the unique circumstances in Montserrat, highlighting the multidimensional nature of the losses due to the volcanic eruption and its aftermath, particularly the loss of support networks (social capital) that people had relied on in the past to help them through difficult times (2). According to the 2001 census, 2,029 persons were economically active (1,154 males and 875 females). Unemployment stood at 13%, with 169 males unemployed compared to 100 females.

The Montserrat school system includes both public and private schools. In 2005, there were three nursery schools, two government run primary schools, two privately run primary schools, and one public secondary school.

One new day care center opened and another was expanded in 2002, which made it possible for more children to access early childhood education at minimal cost. Access to primary education also increased in 2002 with the addition of a fourth grade in one primary school; in 2005, two additional grades were included. The Government constructed Montserrat Community College in 2004.

Of the 2,082 households recorded in the 2001 census, 1,759 had access to publicly supplied water piped into the home; 210 had publicly supplied water piped to the yard; 72 relied on public standpipes; 10 had water piped by a private provider; 3 used public wells (tanks); and the remainder used other means. Of the total households, 1,521 had a water closet linked to a cesspit, 296

had water closets linked to a sewer, 135 had pit latrines, 77 had no toilet facilities, and 53 relied on other means.

### Demographics, Mortality, and Morbidity

The mid-year population in 2005 was estimated at 4,785. The population growth rate for 2003 and 2004 was 2.4% and 2.5%, respectively.

The 2001 Population and Housing Census estimated the resident population at 4,465; 2,405 (53.9%) were males and 2,060 (46.1%) were females. This figure represented a 42% decline from the 1991 census (total population, 10,639, 49.7% male and 50.3% female). This pattern of alternating population growth and decline has been characteristic of Montserrat since censuses began to be conducted. Figure 1 shows the population structure by age and sex, in 1990 and in 2001.

According to the 2001 census, the population under 15 years old accounted for 19.3% (869) of the population that year; the age group 15–64 years old comprised 65.0% (2910); women of child-bearing age (15–49 years old) comprised 23.0% (997). There were 82.0% nationals and 18.0% non-nationals. Since the volcanic eruption, Montserrat's population has concentrated in the north of the island.

Chronic noncommunicable diseases that are influenced by lifestyle choices dominated the morbidity and mortality profiles. Hypertension, diabetes, chronic respiratory diseases, and malignant neoplasms were among the leading causes of death.

In 1999–2003, there were 204 deaths from defined causes. The five leading causes were diseases of the circulatory system, 32.3% (84); malignant neoplasms, 16.3% (42); diabetes mellitus, 15.8% (41); diseases of the respiratory system, 8.5% (22); and mental and behavioral disorders, 5.8% (15). Of deaths from all causes (260), more men (139) than women (121) died. There was one maternal death in 2001 due to complications in pregnancy. In 2004–2005 there were 71 deaths from defined causes. The five leading causes were diabetes mellitus, 17.4% (20); cardiac arrest, 15.7% (18); hypertensive diseases, 14.8% (17); cerebrovascular accident, 7.0% (8); and ischemic heart disease, 7.0% (8). Of deaths from all causes (115), more males (65) than females (50) died.

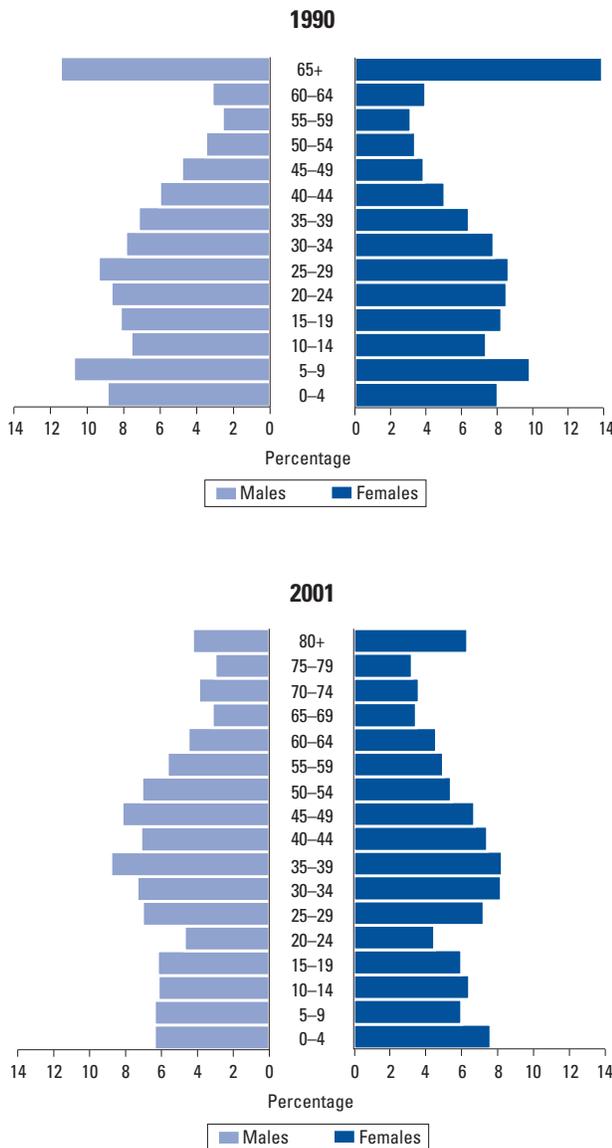
Immigrants to the country mainly came from CARICOM countries (Dominica, Guyana, and Saint Kitts and Nevis top the list), the United States of America, and the United Kingdom.

## HEALTH OF POPULATION GROUPS

### Children under 5 Years Old

In 2000–2005, there were 252 live births. There were no deaths in this age group. The number of low-birthweight babies (under 2,500 g) ranged from 1 in 2000 to 10 in 2005. There were six stillbirths in the reporting period. Child health clinics are held weekly at all health centers; there was 100% registration of children under 5 in the clinics.

**FIGURE 1. Population structure, by age and sex, Montserrat, 1990 and 2001.**



**Children 5–9 Years Old**

There were no deaths in this age group. In 2000, there were 287 children 5–9 years old; school health data indicated that 119 children in this age group were examined by a medical officer and a family nurse practitioner. There were no reported cases of protein energy malnutrition, but obesity was present. The physical examination of schoolchildren is conducted between April and May each year for specific age groups from the nursery, primary, and secondary schools. The required immunizations due at these ages are administered and immunization records are updated. The physical examination includes height, weight, vision, dental

checks, and laboratory tests for hemoglobin. In 2002, 176 students aged 5 to 15 years from five schools were examined (90 males and 86 females). Of them, 78 (44.3%) had normal physical findings and 98 (55.7%) had abnormal findings, with dental caries being the main abnormal physical finding. Other findings included anemia (4), underweight (8), and overweight (18). The male to female ratio of underweight students was 1:3 (3).

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

There were no deaths among 10–14-year-olds and four deaths among 15–19-year-olds. The causes of death were diseases of the circulatory system (1) and external causes (3). There were 35 births to women under 19 years old in 2000–2005, including four in the age group under 16 years old. There was one reported case of HIV infection in the 15–19-year-old age group.

**Adults 20–59 Years Old**

There were 16 new adult cases of HIV infection and one AIDS death reported. Family planning clinics were held weekly, offering the contraceptive pill, injectable contraceptives, condoms, and the intrauterine contraceptive device (IUCD). In 2000–2003, the health centers recorded 604 family planning acceptors. Most births occurred at the hospital and were attended by trained health professionals. According to monthly reports from district clinics, 71.4% of infants were exclusively breast-fed at 6 weeks, while 25.7% were exclusively breast-fed up to 5 months. In 2001, 53 pregnant women were registered at district clinics, of whom 9 had mild to moderate anemia. The majority of babies (112) delivered during 2004 and 2005 were born to women between 30 and 34 years old (31), followed by mothers in the 20–24-year-old age group (24). In those same years, 27 mothers delivered by cesarean section; most cesarean sections were performed on mothers 30–34 years.

**Older Adults 60 Years Old and Older**

In 2001 and 2002, the age dependency ratio was .54; the male to female ratio was 1:1. There was an increasing prevalence of dementia and its complications, and many elderly persons received psychological services geared for older adults.

In those same years, the population older than 60 years old represented approximately 16% of the population. There were 149 persons over age 85 in 2002 and 165 in 2004. Many of the elderly are cared for in their homes by relatives and friends. There were 125 elderly in government institutions in 2003. There were 99 deaths in the age group 65 years and older in 2004 and 2005. The main causes of death were cardiac arrest (18), diabetes mellitus (16), hypertensive diseases (12), ischemic heart diseases (6), and cerebrovascular accidents (5). Of the 1,132 hospital admissions in 2004–2005, 302 (27.0%) were in the age group 65 and older. The elderly represented the majority of persons receiving financial assistance and/or social welfare.

According to the 2001 census, the average household size was 2.1 persons. Of the 2,082 households, 1,391 were headed by a male and 691 by a female, compared to 1997 when female headed households were greater in number (4).

In 2005, 287 households (on and off the island) received social welfare financial assistance, at an average monthly cost of US\$ 39,600. Foster care allowance was issued to 13 children to provide assistance with their living expenses, for a monthly cost of US\$ 1,444. One-time grants were approved for 250 persons to provide food packages, home requirements, school supplies, funeral expenses, and medical costs. Total cost of one-off grants was approximately US\$ 101,800.

## HEALTH CONDITIONS AND PROBLEMS

### COMMUNICABLE DISEASES

#### Vector-borne Diseases

The Breteau index for *Aedes aegypti* was above 5%, which indicated that outbreaks of dengue were likely. There were no cases of malaria, yellow fever, Chagas' disease, schistosomiasis, or plague reported in the reviewed period.

#### Vaccine-preventable Diseases

There were no cases of pertussis, rubella, tetanus, neonatal tetanus, or diphtheria during 2001–2005. Vaccination against diphtheria, measles, mumps, pertussis, polio, rubella, and tetanus was maintained at levels of over 95% during the period. The following vaccines are part of the national immunization program: oral polio, diphtheria, pertussis, tetanus, *Haemophilus influenzae* type b, hepatitis B, and MMR.

For 2005, the vaccination coverage of antigens was—MMR (children 12 to 23 months), 100%; for infants (under 12 months), the vaccination coverage for the 3rd doses of DPT/HepB/Hib was 98% and coverage for OPV was 98%.

#### HIV/AIDS and Other Sexually Transmitted Infections

There were 19 persons (8 males and 11 females) who tested positive for HIV infection in 1999–2005, including two prenatal patients, one voluntary blood donor, and five job seekers who returned to their home countries. Health records prior to 1999 were lost during the evacuation. The majority of the reported cases fell within the age group 20–49 (89.5%); one was age 18 years old and the other, age 50 years.

In 1999–2003, 520 blood donors were tested, and 15 tested positive for hepatitis B.

### NONCOMMUNICABLE DISEASES

An audit on quality of care for hypertension and diabetes was conducted in 2001/2002. A total of 137 patients were examined, representing attendance at four public clinics. Of these, 78 (57%)

were females. Of 200 male hospitalizations in 2000, the leading causes of hospitalization were injuries (18%), hypertension/heart-related diseases (15%), diseases of the digestive system (14%), and diabetes/hypercholesterolemia (12%). Of the 189 female hospitalizations, the leading causes were diabetes mellitus (15%), hypertension/heart-related diseases (13%), diseases of the genitourinary system (12%), and diseases of the digestive system (9%).

#### Cardiovascular Diseases

There were 55 deaths due to this cause group, broken down as cardiac arrest (18), hypertensive diseases (17), ischemic heart diseases and cerebrovascular diseases (8 each), and heart failure and all other diseases of the circulatory system (2 each).

#### Malignant Neoplasms

Between 2004 and 2005 there were 14 deaths due to malignant neoplasms. The leading cancer sites were the prostate (5), colon (2), breast (2), pancreas and uterus (1 each), and other sites (3).

### OTHER HEALTH PROBLEMS OR ISSUES

#### Mental Health

In 2005, 80% of the clients were schizophrenic, 5% were diagnosed with bipolar disorder, and 15% with other mental illnesses such as drug induced psychoses, alcoholism, organic psychosis, and senile dementia. There were 100 clients registered on the mental health register; 70% were males and 30% females.

#### Oral Health

A total of 176 children were examined through the school dental health program in 2002. Of these, 75 students (43%) had no dental caries; 48 (27%) had 1–3 or more, 29 (17%) had 4–5 or more, and 24 (14%) had 6 or more.

## RESPONSE OF THE HEALTH SECTOR

### Health Policies and Plans

The Ministry of Health is charged with ensuring that health services available to the residents of Montserrat are accessible, of good quality, and affordable, and that they promote community participation.

Montserrat's 2003–2007 Sustainable Development Plan encompasses six strategic objectives: to promote the retention of the territory's current population and to encourage the return of Montserratians living abroad; to promote prudent economic management, sustained growth, a diversified economy, and the generation of employment opportunities; to promote human development and well-being and enhance the quality of life for all people on the island; to ensure good governance by strengthening public administration and promoting civil society; to im-

prove and expand external relationships as a way to facilitate Montserrat's integration into the regional and global environment; and to ensure that Montserrat's development is environmentally sustainable and includes appropriate strategies for disaster mitigation. The specific objectives for the health sector under the Plan are to develop appropriate health strategies, including a national health development plan; review regulations and policies governing the operations of the health sector; strengthen the institutional management of the sector; adequately provide for medical and nursing training; adequately provide for specialist services; develop policies for the prevention of HIV/AIDS; strengthen health promotion; strengthen actions and measures that inhibit social, environmental, and behavioral patterns and practices that increase the risk of disease among the population; ensure that adequate procedures and programs are in place to control or eradicate all common communicable diseases through a high coverage immunization program and raising public awareness for the promotion of healthier lifestyles; ensure a comprehensive solid waste management policy aimed at ensuring efficient and effective storage, collection, and disposal of waste on the island; and initiate a national health insurance scheme to ensure appropriate access to all. At the heart of the health sector's objectives is the delivery of adequate, affordable, and accessible health and welfare services to the people of Montserrat. A survey of Montserratians living in the United Kingdom found that the provision of adequate and quality health care service is an essential requirement to encourage Montserratians to return home.

The Ministry of Health's 2005–2008 Corporate Plan details the strategic direction for the implementation of health and community services policies of the Government of Montserrat. The Corporate Plan was developed from the government's Sustainable Development Plan and from feedback from Government agencies, other stakeholders, and from various departments. The strategies in the Corporate Plan form the basis for Annual Business Plans.

### Organization of the Health System

Public health and community service functions fall under the responsibility of the Ministry of Education, Health, and Community Services. The Ministry is functionally divided into Headquarters, the Department of Health, and the Department of Community Services. Headquarters is charged with planning and policy analysis to support and strengthen the health system, as well as reviewing any legislation under the Ministry's responsibility. The Department of Health is responsible for providing and administering primary and secondary health care services in the country and assisting Montserratians who wish to access tertiary care elsewhere in the Caribbean. The Department of Community Services is responsible for looking after the well-being of persons in Montserrat by providing policy advice to the Government and protection and care to those in need.

The health care delivery system is organized into primary and secondary health care services. Primary health care is usually provided at the first point of contact in the community, such as at the territory's four clinics (St. Johns, Cudjoe Head, Salem, and St. Peters) and through environmental health, dental, nutrition, and health promotion activities. Secondary care is provided at the 30-bed Glendon Hospital, and includes inpatient and outpatient care, surgery, orthopedics, obstetrics, and gynecology. Access to tertiary care, defined as highly specialized technical inpatient medical care, is offered through referrals to overseas institutions.

### Public Health Services

The vector control program emphasized the control of the *Aedes aegypti* mosquito. Bimonthly surveillance was conducted on a bimonthly basis at sea and air ports of entry.

The Montserrat Water Authority is responsible for the distribution of potable water, and the Environmental Health Department, under the Ministry of Health, is responsible for the monitoring of the water supply. The population was reliably supplied with safe water from springs located in the inhabited area. Despite periodic exposure to the volcano's ash fallout, these sources continued to produce good quality water; the water was regularly put through regular laboratory analysis at the Caribbean Environmental Health Institute (CEHI).

Sewage disposal continued to pose a challenge; new technologies were introduced and the public's perception and acceptance of them were low. The most pervasive disposal system was through septic tanks with soakaways. Given the soil structure in Montserrat, it was difficult to attain an acceptable percolation rate for the safe disposal of effluent. Two sewage treatment plants and a proposed maturation pond for the new housing developments are expected to overcome existing challenges. Solid waste management has improved slowly. The operations of the landfill site and a waste reduction strategy saw little success. Health promotion and prevention activities continued to be the main strategies for changing behaviors in the population that would result in a cleaner environment.

Island-wide, air quality remained adequate, helped by prevailing winds and low emissions from sources such as automobiles. However, ash emissions from the volcano continued to affect mainly the population in the south of the island. Dust monitoring was suspended by the Montserrat Volcano Observatory due to equipment failure. Volcanic ashes such as sulphur dioxide and hydrogen chloride were monitored daily. Residents were provided with ash masks and were advised to wear them during ash fallouts or when cleaning areas affected by ash.

Food control efforts centered around monitoring, targeting sanitation, food quality, and building alliances with such agencies as the Consumer Association. Through an increase in the frequency of inspection of food establishments and by networking with stakeholders, particularly the public, the Ministry of Health's Department of Health made significant strides in providing safer

food for consumption. There were no confirmed cases of outbreaks of food poisoning, although there appeared to be an increase in the number of ciguatera poisonings associated with various species of fish.

The goal of the food and nutrition policy and program is to improve the food and nutritional health status of the population by improving household food security; protecting consumers through improved food quality and safety; caring for socioeconomically deprived and nutritionally vulnerable groups; promoting proper diet and healthy lifestyles; preventing and managing micronutrient deficiencies; assessing, analyzing, and monitoring food and nutrition situations; and incorporating nutrition objectives and sectoral and national development policies and plans.

### Individual Care Services

The Government continuously embarked on programs to improve the standard of health care in both the primary and secondary levels. In 2002, the St. Johns health center was expanded to include consulting rooms, office accommodation, ancillary areas for both doctors and medical staff, and a mental health day care center. St. Peter's health center was also upgraded. These improvements ensured a better environment in which to provide basic health services in the various communities. In 2002, US\$ 2.1 million was spent to develop the health services. This enhanced the ability to attract specialist surgeons and to expand the types of service procedures available on the island, thereby decreasing the need to fly patients abroad for care.

The operating theatre at Glendon Hospital was completed and fully equipped at a cost of US\$ 555,000. A new modern mortuary was completed at Glendon Hospital in 2004. During 2000–2003, 98 patients were transferred from Glendon Hospital to a health care facility overseas for management or specialized care. Patients went to Antigua (80), Guadeloupe (13), the United Kingdom (1), Trinidad (2), and one each to Jamaica and the United States of America. Most transfers (34) occurred in 2001.

One blood bank operates from the hospital laboratory. In 2000, the laboratory achieved a satisfactory level of operation, with all departments fully operational, including the bacteriology department. That year, the laboratory performed 106,475 hematology, biochemistry, bacteriology, rapid plasma regain (RPR), HIV, and hepatitis tests.

Three institutions provide care and housing for the elderly—Margeson Memorial Home, Hill View Home, and the Golden Years Home; in 2004–2005 there were 98 residents. The mental health unit is responsible for enhancing and strengthening the psychiatric/mental health services. To that end, the following initiatives were undertaken: the mental health act was revised; a mental health policy was developed; the mental health committee was reactivated; prioritizing the housing needs of the mentally challenged was prioritized; educational programs for the public

were developed; and an area for establishing a secure facility for providing acute care was identified. There is presently no mental institution in Montserrat; mentally challenged clients are managed in the community. They continue to live in various communities and access care through visits to the mental health clinic and participation in group and occupational therapy. If required, persons are hospitalized at the General Hospital.

A dental health plan prepared in 2003 is designed to develop and implement quality assurance programs for dental care delivery; to revive and review prevention and dental health programs in schools; to improve the Government's dental care program; to develop ongoing training for staff; to establish a data entry and retrieval system of dental records; and to review the policy dealing with accessibility of treatment by the general public.

### Health Promotion

The Health Promotion Unit was staffed by a health educator. In 2005 an intersectoral health promotion team was formed, which included the participation of representatives from NGOs and the private sector from within and outside the health sector. The team was conformed to comment on health activities and projects and to help avoid duplication on health efforts. In addition, it advised on health promotion issues and drafted a newspaper column, "Health Corner," covering a variety of health issues and providing health tips, updates, and general health information. The team also collaborated with the HIV/AIDS coordinator, participated in the follow-up of a cervical cancer prevention and care program, disseminated the strategies of the Caribbean Health Promotion Charter to colleagues and others, and taught the health promotion component in a nurses training program.

### Human Resources

Continuous education for health workers in the reporting period included participation in seminars or courses on special blood banking; laboratory management and quality management; occupational safety and health; health informatics; anesthesia; psychiatric nursing; public health; nursing education; gerontology; diagnostic radiography; mass casualty; stress management; breast-feeding; use of the fetal monitor; infection control; and a nursing care plan.

### Health Supplies

There are no locally produced drugs, reagents, or biologicals in Montserrat. All items are imported through the Organization of Eastern Caribbean States/Pharmaceutical Procurement Service, which audits procurements on an annual basis. The blood bank depended on voluntary/replacement donors to replenish its blood supply. There were no accreditation committees or regulating agencies in place.

## Life under the Volcano

After the Soufriere Hills Volcano erupted in 2000, three-quarters of the population left Montserrat. Those who remained and lived in the city of Plymouth and other urban areas in the south, or who farmed the productive agricultural lands in that zone, were forced to pull up stakes, abandoning homes, businesses, and farms and relocating to the north, away from the devastation and continuing volcanic threats. The dislocation of the population sent aftershocks into the economy. Tourism dried up, as many villas and the main hotel were trapped in the volcano exclusion zone. Agricultural and commercial assets were destroyed, crippling the private sector. According to the Government's 2003–2007 Sustainable Development Plan, retaining the territory's current population and encouraging those who have left to return is key to rebuilding Montserrat. To offset the loss of social support networks, the Government has developed a comprehensive welfare system as a safety net for vulnerable groups. It provides a basic allowance for food for the needy and a rental subsidy for vulnerable government housing tenants, mainly elderly and physically or mentally disabled persons.

### Health Research and Technology

In October 2000, in an effort to determine the effect, if any, of volcanic ash on lung function, a consultant and his team from the United Kingdom conducted an ash exposure survey on 400 local residents.

### Health Sector Expenditures and Financing

In 2003, recurrent expenditures in health amounted to US\$ 3.9 million, increasing to US\$ 4.3 million in 2004, and to US\$ 4.6 million in 2005. Revenue collection from Glendon Hospital in 2003–2005 included US\$ 10,000 from the x-ray department; US\$ 45,000 from the laboratory; US\$ 48,000 for cold body storage; US\$ 15,000 for casualties; US\$ 34,000 for medicine and materials; US\$ 22,000 for surgery; US\$ 1,000 for anesthesia; US\$ 1,000 for operating theatre use; US\$ 13,000 for wards; and US\$ 3,000 for electrocardiograms (5). Actual and expected expenditures for the health and social welfare sector in 2003–2005 totaled US\$ 3.2 million.

### Technical Cooperation and External Financing

Globalization had both a positive and negative effect on Montserrat's development. Montserrat, as one of the founding members of CARICOM and the OECS, continued to play a part in regional affairs and dealt with the challenges that face small island states. The European Union made provisions for a deeper partnership between overseas territories and the European member states. The 1957 Treaty of Rome defined special arrangements for the association of the community with the Overseas Territories, setting up the European Development Fund and providing measures dealing with the right of establishment and trade. Financing was critical for the success of the Sustainable Development

Plan and, in turn, for Montserrat to be able to achieve its broad developmental objectives. The funds available determined the pace and success of Montserrat's development. Much of the infrastructure that was lost to the volcano had to be replaced at considerable cost. While considerable resources were expended to replace it, much work remained to be done. The loss of two-thirds of the population led to a decrease in tax receipts and other revenue sources for the Government. This lower revenue, combined with an increase in expenditures, led to a large and unsustainable budget deficit. This deficit required financing by donors. In 2003–2005, ongoing and planned funding was expected from the Caribbean Development Bank (CDB), the United Kingdom's Department for International Development, the European Development Fund (EDF), the Republic of Ireland, the Pan American Health Organization and other regional institutions, private sources, and others (6).

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