
MONTSERAT

Montserrat stretches for 102 km² of mountainous terrain, and is part of the Eastern Caribbean volcanic island chain that extends from Saint Kitts in the north to Grenada in the south. It is a British dependency with its own system of government: the executive branch comprises a Chief Minister and three other ministers, all elected by the people, as well as a Governor who represents the British Government.

The prolonged eruption of the Soufriere Hills Volcano, which started in July 1995 and continues to date, was the pivotal event for Montserrat during the 1994–1997 period. The eruption has severely affected every aspect of Montserrat's economy, politics, development, and overall living conditions.

An in-depth discussion of these issues is outside the scope of this report, but a brief review of the volcanic emergency provides a useful context in which to view the territory's health conditions. It also should be noted that the upheaval and uncertainty have wreaked havoc with health service maintenance, recordkeeping, and the overall collection of information. Furthermore, the drastic population shifts compromised the quality and quantity of information that could be collected.

THE VOLCANIC EMERGENCY

The current eruption is Soufriere Hills volcano's first in more than 300 years. A series of earthquakes in 1992 may have marked the beginning of the current volcanic activity. In July 1995, the volcano first began venting ash, steam, and gases, and has continued to do so with increasing intensity. A major eruption in June 1997 resulted in 20 deaths, the destruction of many villages, and the closure of the island's only airport. Travel into and out of Montserrat was only possible from nearby Antigua via ferry or helicopter.

Over the two-and-a-half year period of volcanic activity, the dangerous area (the "exclusion zone") progressively ex-

panded, and by the end of 1997, the southern two-thirds of the island had become unsafe. This included Plymouth, the capital and the territory's industrial, commercial, and government center, as well as the location for essential services. Plymouth's destruction and abandonment and the near total destruction of the capital's infrastructure triggered a steep economic decline. Glendon Hospital also was destroyed and is now relocated in a former school at St. John's in the territory's north.

Most of the population lived in Plymouth and its environs, and many families lost their homes. The number of persons evacuated out of the exclusion zone progressively increased over the years of the emergency, despite the fact that the territory's overall population decreased steadily as many persons fled the island. Initially, displaced persons were housed in temporary shelters in the north, but these soon became overcrowded. As new housing becomes available, however, the pressure on these shelters should significantly ease.

Most agriculture was conducted in the south, and had to be abandoned. The Government has leased or rented land in the safe zone for livestock and crop production, but farming has only been able to continue on a much reduced scale.

The tourist industry has been particularly hard hit. Earnings from this sector fell from US\$ 14.5 million for the first six months of 1995, to US\$ 5.9 million in the first six months of 1996. Figures for 1997 are not yet available, but these are expected to show an additional sharp decline.

The GDP was EC\$ 147.32 million in 1994, EC\$ 139.18 million in 1995, EC\$ 116.32 million in 1996, and EC\$ 115.31 million in 1997, representing negative real growth rates of 0.04% in 1994, 7.64% in 1995, 17.69% in 1996, and 1.73% in 1997.

The inability to predict the course of the volcanic activity will seriously affect Montserrat's near and mid-term future. Good information collection, recording, and analysis are critical for effective planning and an efficient use of resources. Clear and dedicated leadership is particularly important in the present circumstances, where activities must fit available

resources and where the capability to effectively respond to the emergency must be maintained.

GENERAL SITUATION AND TRENDS

Accurate population figures were extremely difficult to track in the emergency, as many residents left to spend varying periods abroad. The best population estimates show a drop from 10,402 in 1994 to 5,600 in 1997. By January 1998, the population had sunk to 3,483. There were 150 live births in 1994, 126 in 1995, and 128 in 1996. Age and sex breakdowns are not available for the period under review.

The crude death rates for the period were 9.3 in 1994, 12.1 in 1995, and 12.6 in 1996. Infant mortality rates for these same years were 13.0, 24.0, and 7.8. Data for 1997 are not available. Given the difficulties in obtaining accurate population and age breakdown figures, rates should be interpreted with caution.

In 1994, the leading causes of death for the age group 30 years old and older were heart diseases, malignant neoplasms, cerebrovascular disease, diabetes mellitus, diseases of the respiratory system, and diseases of the digestive system. In 1996, diabetes mellitus ranked first as a cause of death, followed by heart diseases, malignant neoplasms, hypertensive disease, cerebrovascular disease, and malnutrition. Malnutrition ranked as the sixth leading cause of death in 1996, and these deaths all occurred in the elderly (age group 70–99 years old). Although mortality data for 1997 are not available, deaths in that year were mostly due to severe burns caused by the eruption. These deaths were three times as high as the leading cause of death for the years reported, and are likely to remain the leading cause of death for 1997.

There were 1,302 admissions to Glendon Hospital in 1994 and 1,106 in 1995. In 1996, there were 1,166 admissions to St. John's Hospital. Diabetes, hypertension, heart disease, pregnancy, and gastroenteritis were the main causes for hospital admissions over the 1994–1996 period.

SPECIFIC HEALTH PROBLEMS

Analysis by Population Group

Among adults, diabetes and hypertension were the two most common reasons for clinic attendance over the period under review, followed by heart disease, asthma, and upper respiratory tract infections complete.

The elderly receive special attention. At the end of 1997, 126 elderly persons were housed in four homes/shelters for seniors operated by the Government and the Montserrat Red Cross, and the Red Cross is constructing another 50-bed

home. There are another 180 elderly persons living in homes or community shelters who receive home help and other assistance.

Special attention has been given to the refugee shelters and their populations. Severe overcrowding early during the emergency could easily have led to health problems, but environmental health measures were put in place to manage solid waste disposal, improve toilet facilities, provide adequate potable water, and ensure food safety. District nurses added the shelters to their portfolio for home visits. A communicable disease surveillance system was put in place to monitor outbreaks. The shelter population peaked at about 1,400 in April 1996, but by the end of 1997, the number of persons in shelters had fallen to approximately 500.

Analysis by Type of Disease or Health Impairment

The number of cases of *gastroenteritis* among children under 5 years old varied from 57 in 1994, to 35 in 1995, and 42 in 1996. From 1994 to 1996 there was an average of about 100 gastroenteritis cases per year in the population 5 years of age and older (96, 93, and 112 cases, respectively).

Reported cases of *influenza* rose from 66 in 1994 to 90 in 1996.

An outbreak of *dengue fever* began in October 1994 with 327 reported cases; there were 750 cases reported in 1995 and 2 in 1996.

Montserrat has established a multisectoral *AIDS/STD* council. The territory continues to observe all regional guidelines, and blood for transfusions is screened. In the review period there were two confirmed cases of AIDS in Montserrat and no deaths.

The number of cases of *ciguatera* poisoning rose from 22 cases in 1994 to 28 in 1995, dropping to 14 in 1996.

In 1997, there were 110 patients on the psychiatric register, with the most significant mental disorders being *chronic schizophrenia*, *manic depression*, *substance abuse psychoses*, and *depression*.

RESPONSE OF THE HEALTH SYSTEM

Organization of the Health Sector

Primary care services have continued to be provided throughout the emergency, despite such difficulties as the need to close clinics within the exclusion zone and the loss of health personnel. Primary care clinics decreased from 12 in 1994 and 1995, to 5 in 1996, and 3 in 1997.

Plymouth's 65-bed Glendon Hospital, newly rebuilt in 1989 after Hurricane Hugo, was destroyed, and hospital services

were relocated to St. John's in the north. A school building has been fitted to serve as a center for providing limited *secondary care*, mainly medical and uncomplicated elective surgery. The facility at St. John's has a bed capacity of 30, but up to 10 beds may be occupied by discharged patients awaiting to return to the community. Patients are referred to Antigua and Saint Kitts for care unavailable in Montserrat.

Hospital laboratory services are limited to simple hematology and biochemistry investigations and blood banking; no microbiological investigations are performed. The X-ray department is able to perform basic emergency investigations with a portable X-ray unit.

Health Services and Resources

Prenatal care is provided at the three district primary care clinics and by two doctors in private practice. Delivery care is provided at St. John's Hospital for low-risk pregnancies; all high-risk pregnancies are sent to Antigua or Saint Kitts. Post-natal care is provided at the three district clinics at six weeks after delivery and then at the mother's place of residence.

Family planning services are offered at the three district primary care clinics and by the two private practitioners.

The *immunization program* has continued to operate well throughout the volcanic emergency. Coverages for DPT, MMR, and polio are estimated to near 100%. Immunizations are administered at the primary care clinics and as part of the preschool physical examination program for 4–5-year-old children upon entering primary school. Of the diseases covered by the Expanded Program on Immunization (EPI) there were two suspected cases of measles reported, one in 1994 and one in 1995. There was one case of diphtheria reported in 1995. There were no reported cases of mumps, rubella, pertussis, tetanus, or polio over the period.

A retired psychiatrist and a psychiatric nurse manage the *mental health services*. The program is mainly community-based, with one clinic being held specifically for follow-up of psychiatric patients. The number of clients served rose from 100 in 1994, to 220 in 1995, and 240 in 1996, before dropping to 110 in 1997.

Organization of Services for Care of the Population

Vector Control, Water Supply, Sewerage Systems, Solid-Waste Disposal, and Pollution Monitoring. The Pest Control Unit directed most of its efforts toward the control of the *Aedes aegypti* mosquito. Integrated vector control methods were used to control all mosquitoes, flies, roaches, rats, and mice. An outbreak of dengue fever in October 1994 mobilized most of the population in an islandwide mass cleanup program for

source reduction, which helped to control the outbreak within four months.

The volcanic emergency required a massive relocation of the population to the north of the island, which set back the vector control program and led to a proliferation of many insects, pests, and rodents, especially in and around the crowded shelters.

A survey of Montserrat's water supply system in 1997 confirmed that the water supply had not been contaminated by volcanic products, but continued monitoring would be necessary. Most of the water sources were located in the south of the island, where most of the population lived before the volcanic eruption began, and water sources and storage areas in the exclusion zone were abandoned. It is estimated that adequate amounts of water can be obtained to meet future demand, with some changes in the pumping, piping, and storage characteristics of the water supply system.

A program to facilitate the construction and use of pre-cast latrine units was implemented in 1995. A public education program on the proper maintenance of septic tank systems was also carried out in 1995.

Refuse collection was privatized in March 1995, which markedly improved solid waste management. Prior to the crisis, the Government had procured a 55-acre plot that was to be developed as a sanitary landfill site, but the site had to be abandoned because it was located in the exclusion zone. An alternative site has not been found, and a temporary site is under use. This remains as a significant problem.

Air quality is monitored by measuring the concentration of respirable dust, and is reported to the public by the Montserrat Volcano Observatory. The air quality in the safe zone in the north of the island has been consistently within acceptable limits.

Human Resources

Montserrat has experienced a flight of health staff since the volcanic crisis began. The number of registered nurses dropped from 40 in 1994 to 13 in 1998. Staffing shortfalls mostly have been offset by human resources from other Caribbean countries and the United Kingdom.

Expenditures and Sectoral Financing

Expenditure at present is heavily dependent on the United Kingdom aid budget for Montserrat. Health expenditure as a percentage of Montserrat's total budget was 16.5% in 1994, 17.5% in 1995, 13.4% in 1996, and 13.5% in 1997; health expenditure as a percentage of the total recurrent budget was 16.5%, 17.5%, 16.9%, and 16.7%, respectively.