

Re-emergence of Bolivian Hemorrhagic Fever

In July and August 1994, an outbreak of Bolivian hemorrhagic fever (BHF) occurred among an extended family living in the city of Magdalena (1994 population estimates 5,300), Itenez Province, Department of Beni, Bolivia (see map). BHF, caused by the Machupo arenavirus, is known to be endemic only in Bolivia. The principal reservoir of the Machupo virus is the small rodent *Calomys callosus*.

This outbreak of BHF affected five of seven family members and two other relatives. The index case was the head of the household, who initially reported symptoms starting 4 July. He was admitted to Magdalena hospital on 10 July with suspected salmonellosis and remained there until the 12th; he was readmitted on 14 July, remaining until the 20th. Based on reports from family contacts, a 10-year-old daughter became symptomatic between 25 July and 2 August, while her mother became symptomatic between 3 August and 6 August. The other four patients fell ill between 8 and 12 August and the age of the patients ranged from 10 months to 50 years, including two males and five females. Two girls, aged 4 and 7, did not become ill.

Family members developed illness characterized by fever, chills, muscle ache, cramps, asthenia, anorexia, diarrhea, dehydration and hypotension. Other signs included hemorrhagic gingivitis, epistaxis, subconjunctival hemorrhage, melena, petechiae, sanguinolent vomiting, and vaginal bleeding. Neurological symptoms were noted including tremors, convulsions, dysarthria, and obtundation. Some cases developed an acute leukopenia (lowest noted to be 1,300/mm³) and thrombocytopenia (lowest noted 72,000/mm³). Six of the seven patients died. The deaths occurred between 15 and 18 August, four of them in the city of Trinidad, where the patients had been transferred and hospitalized.

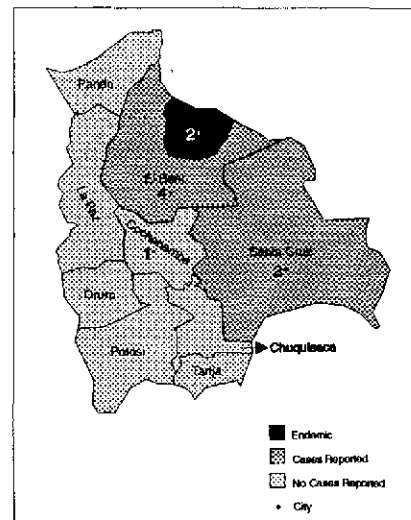
Laboratory studies performed on serum and tissue specimens from decedents confirmed the diagnosis of BHF by isolation of Machupo virus and detection of viral antigen in all five patients for whom specimens were available; the survivor developed enzyme-linked immunosorbent assay (ELISA) immunoglobulin M (IgM) and immunoglobulin G (IgG) antibodies to Machupo virus. The laboratory diagnosis based on the detection of antigen and antibodies was confirmed less than 48 hours after its initiation.

Preliminary epidemiological studies suggest that the index case (a man of 29 years) was infected outside Magdalena and possibly provided a source of exposure to Machupo virus for other family members. The onset of his illness began 9 days after his return to that city after working 1 month on a cattle ranch, with brief stopovers at other ranches or rural "estancias" on his way home. The family's initial contact with him during his

illness occurred on 12 July when they stayed with him for 2 days during his hospitalization. The daughter and the mother were possibly infected by direct virus spread from the index case or indirect contact through contaminated fomites. The other two children may have been infected by the index case; however, the possibility that they represent cases of secondary transmission from person to person within the family cannot be excluded. A niece had contact with the family only on 24 or 25 July for a period of no more than one hour. The remaining case was the 50 year old grandmother, for whom the reported date of onset of symptoms was between 8 August and 11 August. Although a non-resident of Magdalena, she may have been infected with Machupo virus when taking care of the index case or by exposure to a second case among the other family members.

During or before the outbreak, no suspected cases of BHF had been reported in Magdalena. Subsequently, a 34-year-old man with symptoms typical of BHF that began on 28 August died on 5 September in Cochabamba, Bolivia; he was potentially infected in rural areas surrounding Magdalena or while travelling to ranches outside Magdalena. On September 3, a 52-year-old agricultural worker from Poipon, El Beni Department, developed a febrile hemorrhagic illness; on September 11, he was admitted to a hospital in Trinidad, El Beni Department (see map). On September 13, intravenous ribavirin therapy was initiated for a presumptive diagnosis of BHF, and the patient recovered. The diagnosis of BHF was confirmed by detection of viral antigen and virus isolation from the sera of both patients.

Area in which Bolivian hemorrhagic fever is endemic and four cities* in which suspected cases were identified Bolivia, July 1 - September 30, 1994



National and local health authorities launched a campaign to trap and poison rodents and to clean dwellings inside and outside in Magdalena, San Ramón, San Joaquín, and some livestock holdings. The campaign was carried out with community participation; emergency committees were organized and health education provided. Health workers, and especially brigades of rodent catchers from the BHF Control Program, actively participated in the control operation. By late August, only three *C. callosus* were caught in the Magdalena area, and in September, nine; from these, samples were taken to determine infection by Machupo virus. Since rodent control measures were instituted following the family outbreak, the small number of *C. callosus* trapped may either reflect the result of rodent control efforts or naturally occurring low frequency of *C. calomys* in recent months.

The last laboratory-confirmed outbreak of BHF was nosocomial and occurred in Cochabamba in 1971--the result of a case from the endemic area who was hospitalized in that city. However, outbreaks in Magdalena and San Joaquín were reported until 1975, diagnosed both clinically and epidemiologically. From 1976 to 1992, there were no reported cases in Bolivia. In 1993, a fatal laboratory-confirmed case occurred in the San Ramón area. Between February and March of 1994, several suspected cases of BHF were reported around San Ramón,

and two of them, from a ranch in Pocona, were confirmed serologically by the Centers for Disease Control and Prevention, (CDC), Atlanta.

The current household outbreak coincided with the visit of a group of experts sent by the Pan American Health Organization (PAHO) to Bolivia to collaborate in the strengthening of the National BHF Control Program. The advisors provided technical cooperation and drew up a Plan of Action, which includes training in clinical diagnosis and case management, health education, laboratory diagnosis, epidemiologic surveillance, and epidemiologic and ecologic studies. In late August, three experts from the CDC (supported by the United States Agency for International Development) were sent to Bolivia to provide cooperation in clinical, epidemiological, and ecological aspects of the disease. From 26 to 30 September, a PAHO consultant conducted a workshop on clinical diagnosis and patient management was held in Trinidad. Authorities from the National BHF Program actively collaborated with the experts from PAHO and the CDC.

Source: National BHF Program, National Health Secretariat of Bolivia; Regional Health Secretary, El Beni Department, Bolivia; National Bureau of Disease Surveillance and Risk Control, Pan American Health Organization, PAHO (Communicable Disease Program and PAHO Representative Office in Bolivia), and Centers for Disease Control and Prevention (CDC), Atlanta.

Epidemiological Surveillance in Haiti: Experiences and Outlook

With the purpose of analyzing the trends in certain diseases and in the use of the health services, a surveillance system was set up in Haiti in November 1991 that has been functioning as a network of sentinel centers. This system has two components, one consisting of monthly data collection and another that covers certain specific pathologies, such as poliomyelitis, neonatal tetanus, tuberculosis, cholera, typhoid fever, malaria, and AIDS. The system is simple, sensitive, flexible, and relatively cost-effective, and it makes it possible to adopt appropriate and timely measures. The results obtained to date are very encouraging.

The health sector in Haiti, which largely depends on external assistance to finance its activities, has been adversely affected by the political problems that began in 1986. As a result of the aborted elections in 1987, the donor countries suspended financing of all the programs

and projects carried out by the Ministry of Public Health (MPH). Certain priority activities were financed indirectly, the administration of their funding being guaranteed by multilateral agencies. The events of 30 September 1991 led to a total cutoff of external aid and technical assistance and culminated in the suspension of all projects carried out by nongovernmental organizations (NGOs). This situation lasted until March 1992.

Faced with a total and sudden lack of health information, the Haitian Children's Institute (HCI), with technical and financial assistance from several organizations, established an Epidemiological Surveillance System (ESS) that has made it possible so far to monitor the evolution of certain pathologies such as malnutrition, diseases preventable by vaccination, diarrheal diseases, and acute respiratory infections.