

Infectious Diseases in Latin America and the Caribbean: Are They Really Emerging and Increasing?

During 1995, infectious disease epidemics in Latin America and the Caribbean received wide publicity: dengue throughout the region, Venezuelan equine encephalitis (VEE) in Venezuela and Colombia, and hemorrhagic fever in Nicaragua. Increased awareness of these diseases followed extensive reports in the scientific community about the threat of emerging infections (1,2). Are infectious diseases increasing in the region or are we simply seeing the results of better reporting of persistent problems? Analysis suggests that both factors are at work.

Dengue and Dengue Hemorrhagic Fever

During the 1950s and 1960s, under the leadership of the Pan American Health Organization (PAHO), most countries in the Americas successfully reduced or eliminated infestation with *Aedes aegypti*, the principal vector of dengue and urban yellow fever. As a result, much of the Americas became free of dengue. Dengue transmission, however, persisted in many Caribbean islands and in some countries of northern South America that failed to control the vector; therefore, several outbreaks occurred during the 1960s and in subsequent decades (3).

Ae. aegypti eradication programs, however, were not sustained and the mosquito reinfested all Latin American countries except Chile and Uruguay. As a consequence, dengue spread throughout the region, causing severe epidemics or even pandemics during the 1970s and 1980s. Currently, dengue is endemic in virtually all countries with *Ae. aegypti*, and epidemics occur periodically.

Between 1968 and 1980, only 60 suspected or confirmed cases of dengue hemorrhagic fever (DHF) were reported, all by five countries in and around the Caribbean. After the 1981 DHF outbreak in Cuba, reports of DHF in the Americas markedly increased. The Cuban epidemic was the most notable event in the history of dengue in the Americas: almost 400,000 cases of dengue, over 10,000 cases of DHF, and 158 deaths were reported. The Cuban authorities implemented a successful vector control program and the country is still virtually free of *Ae. aegypti*. After this

outbreak, cases of DHF continued to occur in the Americas, although at relatively low levels, until 1989 when another large epidemic with 2,500 cases of DHF occurred in Venezuela. Since then, Venezuela has reported large numbers of DHF cases every year, and in 1995 the country reported the largest outbreak of dengue/DHF in its history: almost 30,000 dengue cases and 5,000 DHF cases. Since 1968, 25 countries of the Americas have reported more than 35,000 confirmed or suspected DHF cases and approximately 500 deaths.

In 1995, dengue and DHF activity in the region was higher than in any year except 1981. As of November, countries in the Americas had reported more than 200,000 dengue cases and 6,000 DHF cases, and approximately 90 deaths. Brazil has had the largest number of dengue cases, but more than 80% of the DHF cases occurred in Venezuela. The reinvasion of the Americas by dengue virus type 3, which had been absent for 16 years, has increased the threat of large epidemics and consequent risk for DHF (4). This serotype was isolated in Panama and Nicaragua at the end of 1994, and in 1995 it spread to other Central American countries (except Belize) and Mexico, causing severe outbreaks. High levels of infestation with *Ae. aegypti* are common from the United States to Argentina, making it likely that dengue epidemics will increase in frequency and severity.

Cholera

Another disease reemerging in the Americas is epidemic cholera, which had been absent from this hemisphere for approximately 90 years before it was introduced into Peru in January 1991 (5). Since then more than 1 million cases of cholera have been reported in 20 countries in the region. Only Uruguay and the islands of the Caribbean have been spared. Though the annual total of reported cases has decreased since 1991, the disease is persistent and problematic in several Latin American countries.

Venezuelan Equine Encephalitis

An outbreak of human infection with VEE virus associated with a large number of equine cases and deaths was detected in northwestern Venezuela in April 1995. The disease spread to the adjacent Colombian state of La Guajira in September (6). Unusually heavy rains during 1994 and 1995 contributed to the epidemic by

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increasing breeding sites for the mosquito vectors *Ae. taeniorrhynchus* and *Psorophora confinnis*. Viral strains with epizootic and epidemic potential appear to have emerged from enzootic strains maintained in enzootic rodent-mosquito cycles (7). In addition, failure to immunize wild and domestic equine populations allowed the virus to amplify and spread. By mid-October 1995, reported human cases totaled 26,500 in Venezuela and 22,300 in Colombia, with 24 deaths in the latter. Attack rates in severely affected communities were 18% to 57%.

This epidemic of VEE is the largest since that of 1962-1971, when the disease extended from northern South America through Central America and Mexico to the United States (8). Intensified vector control (including application of adulticides and larvicides), equine vaccination, and restriction of equine movement appear to have at least temporarily controlled the epidemic.

Leptospirosis

In late October 1995, Nicaragua reported several hundred cases of a hemorrhagic febrile illness in and near the community of Achuapa, approximately 110 km northwest of Managua; eight patients died. The affected communities had experienced unusually heavy rains and flooding during the 2 weeks before the cases were noted. Although dengue was occurring elsewhere in Nicaragua at the same time, that diagnosis was excluded by negative laboratory tests and the absence of *Ae. aegypti* in the local area. In addition, some of the patients had frank pulmonary hemorrhage [not typical of dengue]. By the end of October, the Centers for Disease Control and Prevention had ruled out dengue, other arboviruses, and hemorrhagic fever viruses as causes but had identified leptospira by immunohistochemistry in tissues from four patients with fatal cases. By mid-November, the Ministry of Health reported that 2,480 persons had been ill, 750 were hospitalized, and at least 16 died. (Investigation to define the extent of illness and the responsible serovars was still in progress at this writing.)

Of the examples discussed here, dengue and DHF are certainly reemerging. Dengue has been signaling its return for more than 15 years and DHF since 1989; these diseases will likely persist as epidemic problems unless drastic changes in vector control are achieved. Enzootic VEE has persisted in northern Venezuela and Colombia since the previous major epidemic of 1962-1971. PAHO had urged the countries to increase vaccination coverage of equines because of increased viral activity in 1993 and 1994. The appearance in 1995 of strains similar to these of the 1962-1971 epidemics, with locally intense transmission, raised the possibility that VEE would reemerge as a major epidemic disease. Whether vigorous vector control measures and immunization programs have contained that threat is not yet known, but we must continue to regard the threat as real. Leptospirosis is a persistent, often under-recognized, problem to which the international community has paid relatively little attention. In Nicaragua, public health interest was sparked by concern that the epidemic of a new disease would pose a threat to other communities and countries, but attention waned as that threat diminished. Yellow fever, which is usually present in relatively low numbers in remote areas of South America, reemerged with force in Peru during 1995. At least seven departments of that country have been affected (470 cases and a 40% case-fatality rate by September 1995).

Several factors have contributed to the reemergence of infectious diseases in the Americas. Investments in public health have been decreasing because of economic recession and a shrinking public sector or have been diverted from infectious disease programs to other pressing problems (9). Human populations throughout the region have grown and become increasingly urban, with many living in inadequate housing without sanitation or potable water. At the same time, population and commercial pressures have led to the invasion of forests, exposing people to exotic agents and enzootic diseases, including yellow fever, rabies transmitted by vampire bats, arenaviruses, and others. Human behavior has contributed to epidemic plague in Peru and the rapid spread of diseases such as cholera. To this list can be added the effects of deforestation and habitat and climate change. Unusually heavy rainfall contributed to at least three of the epidemics considered in this commentary (10).

Commentary

Infectious diseases (whether new or re-emerging) are a real and serious problem in Latin America and the Caribbean. To combat the threat of these diseases, PAHO, with the participation of other institutions in the region, has prepared a regional plan to improve surveillance for emerging disease and enhance countries' ability to respond effectively by strengthening laboratory capacity, training, and research and by implementing prevention and control strategies. Ministers of health from countries throughout the region discussed and endorsed the plan at a meeting of PAHO's Directing Council in September 1995. Successful implementation of the plan will require committed action by public health authorities and collaboration and cooperation by many institutions and experts throughout the region.

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