

Aedes aegypti Situation in Bolivia, 1980

In Bolivia, *Aedes aegypti* was found in 1980 in Santa Cruz Department in an area of approximately 85 km², which included the city of Santa Cruz and 45 adjacent localities. Along the navigable stretches of the Abuna and Mamoré rivers there were another 17 infested localities. The presence of the vector was also reported in Yacuiba, Todos Santos, and Puerto Suárez.

In 1943, Bolivia was the first country in the Americas to achieve *A. aegypti* eradication, after an intensive campaign. The country was officially declared to be free of the vector in 1948.

According to information from the National Epidemiology Division, *A. aegypti* surveillance was a responsibility of the Rural Endemic Disease Service from 1948 to 1957. In 1958, this responsibility was transferred to the National Malaria Eradication Service (SNEM). In 1966, the responsibility was again transferred, this time to the National Communicable Disease Institute (INET). In 1971 the surveillance program was reorganized as a result of a joint PAHO/WHO/INET study, and a plan was developed for *A. aegypti* surveillance throughout Bolivia. While sporadic surveys were made in some localities in Beni and Tarija, Santa Cruz Department, as well as systematic surveys at the international airport and railway terminal, surveillance activities at the national level were discontinued in October 1977.

On 7 February 1980, during field practices connected with a course on *A. aegypti* surveillance that was conducted in the city of Santa Cruz for the purpose of training personnel in entomologic surveys, *A. aegypti* larvae and adults were found and were identified by personnel participating in the course. The genus and species of the vector were subsequently confirmed at the Center for Tropical Diseases in Santa Cruz and in the laboratories of the *Aedes aegypti* regional eradication program in Bogotá, Colombia.

In view of the paucity of Ministry of Health resources at the local level, and in order to determine the area of dispersion of the vector, a survey was made around the area of El Trompillo international airport, where the first specimens of *A. aegypti* larvae and adults were found.

A small number of houses in alternate square blocks were inspected and the vector discovered in continuous areas from the airport to the center of the city and even in flower vases in the cathedral. No indices were taken, and therefore the density was not determined. According to information now available, only the city of Santa Cruz and two small nearby communities are infested. Of the 65 localities included in the surveillance plan, 27 have been surveyed, 24 of them with negative results (Figure 1).

Even though the source of the reinfestation cannot be precisely determined, it is believed that the *A. aegypti* might have been carried in airplanes from Cali, Colom-

bia, an infested city with which Santa Cruz has direct air communication, both for passengers and freight.

Emergency Activities

WHO and the neighboring countries were officially notified in accordance with the International Health Regulations as soon as the reinfestation was recognized, and the following activities were begun:

- The health authorities requested PAHO to provide technical advisers from 2-7 March to assist in assessing the situation arising from discovery of the *A. aegypti* reinfestation in Santa Cruz Department and in the planning of control and eradication activities.
- The health authorities declared the *A. aegypti* infestation to be a health emergency and developed a plan to be put into practice at the earliest possible time.
- The immediate objectives of the plan are control of the vector, reduction of its density, and prevention of its dissemination, in order to protect the population against the risk of an epidemic. For a second stage the target of the plan is final elimination of *A. aegypti*.
- Using existing resources in the Health Unit, and with the cooperation of airlines and ground transportation companies—buses as well as railways—all aircraft arriving at or departing from the airport, passenger and cargo planes alike, are to be fumigated in order to prevent the vector from spreading within Bolivia and into neighboring countries. Fumigation has also been decided upon for rail and bus terminals and at vehicle checkpoints or surveillance stations along the highways connecting the city with the rest of the country. Vector control activities were ordered to be instituted around the international airport, hospitals and other selected areas, along with the application of insecticide at ultra low volume (ULV) in the city of Santa Cruz, and with sanitation activities and the elimination of breeding grounds.
- In order to obtain complete information on infestation in the city of Santa Cruz, an entomologic survey was launched to provide a clearer picture of the distribution and density of the vector.
- Yellow fever vaccine is being administered collectively to people traveling to enzootic areas, as well as to international travellers bound for countries where a certificate of vaccination is required. At the surveillance station on the Yapacaní highway leading to the Ichilo area, which has a history of jungle yellow fever, vaccination will be compulsory. Health education, information, and community participation activities in support of emergency programs are being conducted with funds of the Health Unit.

(Biology and Vector Control Program, PAHO.)

Malaria Situation in Costa Rica, 1979

In 1979 the National Malaria Eradication Service examined 176,784 blood samples, of which 307 were found positive to the disease. Of these 274 were *Plasmodium vivax*, 31 were *P. falciparum*, 1 was combined *P. vivax-P. falciparum*, and 1 was *P. malariae*.

The provinces from which most cases were examined were Guanacaste, with 92 (30 per cent of the total), Puntarenas with 78 (25 per cent), and Alajuela with 32 (10.4 per cent). In San José Province, which is outside the malarious area, 69 cases (26 per cent of the total) were detected, most of them imported.

Of the total number of cases in 1978, 177 (58 per cent) were classified as imported: 140 came from Nicaragua, 23 from El Salvador, 12 from Honduras, and 2 from Guatemala.

More cases occurred in the consolidation area, mainly in the course of outbreaks, of which there was one of

major importance in El Roble, Puntarenas, and adjacent areas, and another in Río Claro, in the southern Pacific coastal region.

During September and October, 8 cases were detected in El Roble and adjacent areas, 3 of which were imported from Nicaragua. In a second outbreak, which occurred in Río Claro and four adjacent localities, there were 19 cases, all *P. vivax*.

Conditions during the rainy season favored an increase in the number of *Anopheles albimanus* breeding grounds. Transmission was attributed to this and to migratory movements, primarily from Nicaragua.

(Source: *Semana Epidemiológica*
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Ministry of Health of Costa Rica.)

Recommendations Submitted During the Meeting on Yellow Fever in Belem, Brazil, 18-22 April 1980

Pathogenesis, Immunity and Diagnosis

In the event of a yellow fever epidemic, PAHO should develop protocols and organize a multidisciplinary team to conduct on-site investigations for the purpose of:

- Obtaining serial serum samples from patients as soon after onset of illness as possible and continuing through the acute phase of illness. Such samples are essential to the evaluation of rapid and early diagnostic techniques.

- Field testing the immunofluorescent antibody technique to determine its applicability for rapid diagnosis. To that end, investigations should be promoted to define optimal practical methods for preparing, storing, and shipping slides, and to determine viral strain and cell types to be used to inactivate the virulence.

- Collecting specimens that will allow direct comparison of cell cultures, in particular *Aedes pseudoscutellaris* (AP61), *A. albopictus* (C6/36), Vero, LLCMK₂, and others, with other methods including inoculation of mosquitoes and suckling mice, for isolation of yellow fever

virus and its identification by direct fluorescent antibody or complement-fixation tests.

- Conducting clinical studies on patients to define pathophysiologic features of the disease, including disseminated intravascular coagulation changes, acid-base and hemodynamic changes, possible immunopathologic mechanisms, endotoxemia, the occurrence of late myocardial and prolonged hepatic dysfunction, and the basis for acute renal failure (hepatorenal syndrome versus tubular necrosis).

PAHO should revise and update the manual on histopathologic diagnosis of yellow fever, considering atypical manifestations and lesions of other organs, and should distribute the revised version to laboratories and pathologists, as well as public health personnel.

Ecology and Epidemiology

PAHO encourages and supports ecological studies on yellow fever virus in areas where outbreaks periodically