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Yellow Fever in the Americas, 1981-1982

Five countries in the Americas reported cases of jungle yellow fever between 1981 and 1982 (Bolivia, Brazil, Colombia, Ecuador, and Peru). A total of 368 cases was notified during this period, constituting a slightly higher incidence than was observed in the preceding two years (324). Bolivia and Peru accounted for 84.8 per cent (312) of the cases in 1981-1982, whereas Brazil notified 12.5 per cent (46), Colombia reported 2.2 per cent (8), and only two cases were detected in Ecuador. During 1981 there was an epidemic in Rincón del Tigre, a locality of Sandoval Province in the Department of Santa Cruz, Bolivia, which accounted for about 50 per cent of the cases notified by Bolivia that year.

Table 1 presents cases and deaths for each year by country and major political division. There was a total of 183 deaths reported during the biennium and, with a single exception, all survivors were reported from Bolivia and Peru. In Rincón del Tigre the case fatality ratio was about 10 per cent, although diagnosis of the outbreak was retrospective and based mainly on clinical

grounds. It should be noted that Brazil reports only confirmed yellow fever cases, whereas Bolivia reports all suspected cases in an endemic area. This variation in case reporting criteria constrains major analysis regarding case fatality ratios.

Figure 1 shows the areas in which endemic yellow fever cases were recorded in the Americas for 1981 and 1982. With the exception of the 1981 outbreak in Rincón del Tigre, all cases reported in 1981 and 1982 occurred in known endemic areas of the disease. However, the last confirmed outbreak of yellow fever to occur in the Andrés Ibáñez Province of the Department of Santa Cruz, Bolivia, was in the late 1940s which illustrates the virus' potential to reappear after long intervals of quiescence. The 1980-1981 outbreak which involved the States of Goiás, Mato Grosso, and Mato Grosso do Sul, on the other hand, demonstrates that the cyclical appearance of the virus continues to occur in central and western Brazil. The first confirmed outbreak in the State of Goiás was in 1935 and was followed

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Table 1. Yellow fever in the Americas, 1981 and 1982: reported cases and deaths.¹

Country and administrative subdivision	1981		1982	
	Cases	Deaths	Cases	Deaths
Bolivia	102	29	95	35
Beni	3	2	1	—
Cochabamba	6	3	3	—
La Paz	10	7	3	3
Santa Cruz	83	17	88	32
Brazil	22	21	24	24
Goiás	3	3	—	—
Maranhão	—	—	5	5
Mato Grosso	5	5	2	2
Mato Grosso do Sul	5	5	12	12
Pará	5	4	3	3
Rondônia	1	1	—	—
Roraima	3	3	2	2
Colombia	7	7	1	1
Caquetá	1	1	—	—
Cundinamarca	—	—	1	1
Meta	4	4	—	—
Putumayo	1	1	—	—
Vichada	1	1	—	—
Ecuador	2	2	—	—
Napo	2	2	—	—
Peru	98	47	17	17
Ayacucho	1	—	1	1
Cuzco	85	39	—	—
Junín	4	4	—	—
Loreto	1	1	6	6
Madre de Dios	1	1	—	—
Pasco	1	1	—	—
San Martín	5	1	9	9
Ucayali	—	—	1	1

¹Provisional data.

by others occurring at intervals of five to nine years. The assumption is that these epidemics reflect virus excursions from the enzootic areas of the Amazon Region. There has nevertheless been a decline in the incidence of the disease which is the result, in part, of the intensification of vaccination programs throughout endemic areas, although it must be recognized that surveillance may not be adequate in remote areas. In Brazil, for example, about three million vaccines are administered annually (3,300,000 in 1981), utilizing the 17D vaccine produced by the Oswaldo Cruz Foundation in Rio de Janeiro.

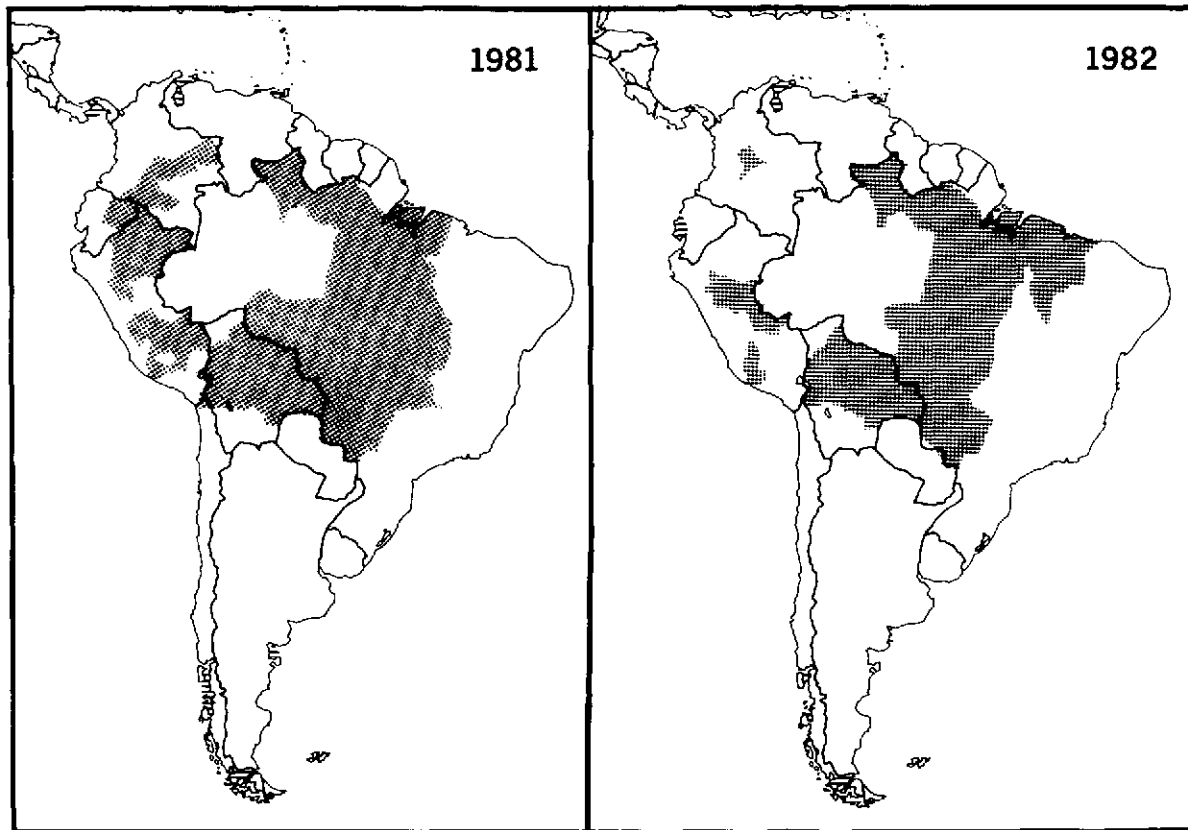
The monthly distribution of cases in the biennium (Figure 2) clearly indicates that the highest number of cases occurs in the first half of the year, peaking in March. This is probably due to the higher densities of *Haemagogus* mosquitoes (the main jungle yellow fever vectors in the Americas) during the rainy season. It is conceivable, however, that the outbreaks observed during the first months of the year may be associated with

increased rural and forest labor practices carried out by susceptible populations in areas where yellow fever is enzootic.

Sex and age distribution were known only for 347 cases. As seen in Table 2, males outnumbered females by a large proportion. The table also shows that a majority of the cases (79.3 per cent) were between 15 and 34 years of age. No cases were recorded in those under one year of age and except for one, all cases occurring in the 1-4 age group were documented in the Rincón del Tigre region during the 1981 epidemic. On the other hand, all Brazilian cases were over 15 years of age. This age and sex distribution of patients is consistent with patterns of jungle (transmitted) diseases. No cases of urban yellow fever have been documented in the Americas for the past four decades in spite of the fact that several jungle cases have been hospitalized in *Aedes aegypti* infested towns during this period.

Since resistance of *A. aegypti* to malathion and temephos has not yet been identified in the Americas, use of

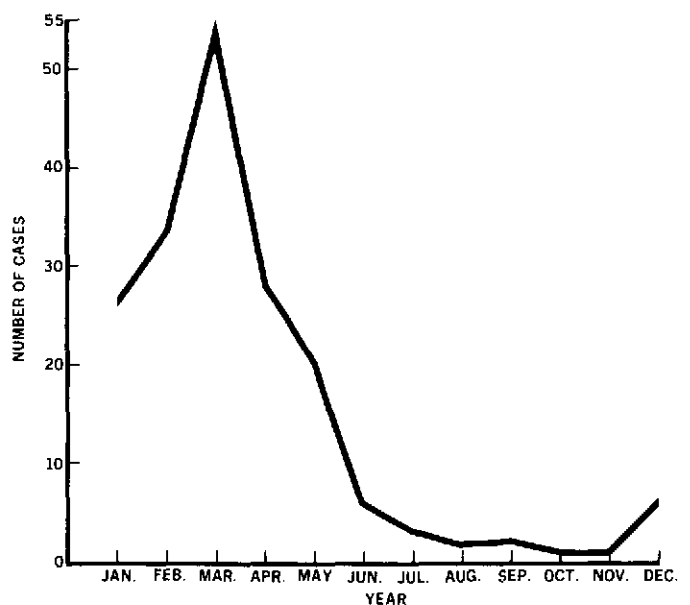
Figure 1. Yellow fever in the Americas: endemic areas, 1981-1982.



these insecticides can be continued. However, monitoring for resistance must be increased due to the fact that both are organophosphates and have been extensively used for several years.

In view of the persistence, expansion, and reinfestation of yellow fever infected areas and in the wake of the first outbreak of dengue hemorrhagic fever (DHF) which occurred in Cuba in 1981, PAHO has recently convened several technical meetings to examine the problem. PAHO and the countries have taken action to follow the recommendations emanating from these meetings. Included among the recommendations are the improvement of surveillance activities at the country level through the updating and distribution of the PAHO *Guidelines for the Surveillance, Prevention, and Control of Yellow Fever*¹ and the WHO *Guide for Diagnosis, Treatment and Control of Dengue Hemorrhagic Fever (2nd edition)*,² as well as the strengthening

Figure 2. Yellow fever in the Americas: average number of cases per month, 1981-1982.



¹ PAHO Scientific Publication 410. Washington, D.C., 1981.

² Technical Advisory Committee on Dengue Hemorrhagic Fever for the South East Asian and Western Pacific Regions, WHO, 1980.

Table 2. Yellow fever in the Americas: cases by age and sex, 1981-1982.¹

Age	Sex		Total	
	Male	Female	No.	%
0-11 months	0	0	0	0
1-4 years	3	4	7	2.0
5-14 years	21	14	35	10.1
15-24 years	141	30	171	49.3
25-34 years	62	13	75	21.6
35-44 years	33	4	37	10.7
45-54 years	9	4	13	3.7
55 years	6	3	9	2.6
Total	275	72	347	100.0

¹ Provisional data.

of direct cooperation with affected countries. Measures have been taken to ensure that the collection and maintenance of representative strains of yellow fever virus is handled at a single institution, the WHO Collaborating Center at Yale University in New Haven, Connecticut. PAHO has continued to encourage and support ecological studies on yellow fever in areas such as Brazil and Trinidad where outbreaks occur periodically, and to determine whether the virus persists in these areas during interepidemic periods. Furthermore, PAHO continues to take steps to strengthen its role in the eradication of *A. aegypti* in the Americas through continually updating inventories of personnel, equipment, and insecticides, and assisting in field and laboratory research.

At the regional level, work has continued to ensure the prompt dissemination of information to member countries on the occurrence and distribution of any suspected and/or confirmed cases of yellow fever and DHF.

The participants of the Meeting of the Technical Group on *Aedes aegypti*, Dengue, and Yellow Fever (Mérida, Yucatán, Mexico, June 1982) also recommended increasing 17D vaccine production in Brazil and Colombia in order to meet rising demands; PAHO is helping these countries modernize their production methods and seeks funds from international agencies to support the development of a 17D vaccine in cell cultures.

The XXI Pan American Sanitary Conference, held in October 1982, resolved (Resolution XXVIII) to maintain the present policy for the eradication of *A. aegypti* from the Hemisphere. The Conference recommended

to the Governments of the countries and territories still infested by the vector that they take appropriate measures to remove the financial and administrative difficulties that may be hindering the progress of their programs, and that they give such priority as is necessary to the allocation of funds, personnel, and materials for the completion of those programs. It was also agreed that the countries and territories that have succeeded in eradicating the vector should step up their surveillance efforts with a view to early detection and elimination, and that those which have suffered reinfestation should take all steps necessary toward eradication. The Conference recommended that countries still infested give the necessary priority to the implementation of measures which prevent exportation of the vector to other countries, at least increasing surveillance and control efforts based on epidemiological knowledge of local situations.

Considering that *A. aegypti* eradication will not be accomplished by all the countries of the Region in the short run, the Conference recommended that each Government draw up an emergency plan to inventory resources available in neighboring countries and a plan of operations for implementation in the event of fresh dengue epidemics or the urbanization of yellow fever.

It was agreed that countries should assist each other either directly or through PAHO by means of bilateral loans and grants and the provision of equipment and materials, and with technical advisory services to vector eradication programs.

The Conference requested that the Director take all the appropriate measures to promote and support national, subregional, and regional activities as speci-

fied in the areas of action for the eradication of the urban yellow fever vector, as well as all the necessary steps to enable PAHO to coordinate, identify, and allocate resources in the event of an emergency caused by a dengue hemorrhagic fever epidemic in any country of the Hemisphere.

Finally, the Conference recommended to the Director that all the appropriate measures be taken to intensify

and accelerate the Hemisphere-wide campaign for the eradication of *A. aegypti*, including the search for extrabudgetary funds, so that the goal of elimination of the vector may be attained as quickly as possible.

(Source: Epidemiological Surveillance and Viral and Rickettsial Diseases, Division of Disease Prevention and Control, PAHO.)

International Health Regulations

A report on the functioning of the International Health Regulations (IHR) for the period 1 January to 31 December 1981 has been prepared by the World Health Organization (WHO) in accordance with the provisions of Article 13, paragraph 2 of the IHR. It was published in the *Weekly Epidemiological Record* (Vol. 57, No. 48, 1982) in agreement with Member States of WHO and the members of the panel on International Surveillance of Communicable Diseases. The report is based on information from national health administrations concerning diseases subject to the IHR and those under international surveillance. The following excerpt includes key portions of the report.

There were reports from 94 countries for the period 1 January to 31 December 1981, compared with 70 in 1980. Although not specifically indicated as a difficulty by any country, the reluctance to notify the presence of a communicable disease situation promptly and completely to the extent that it is known is the most significant problem in the administration of the IHR.

Another understandable cause for nonreporting is the fear of losing tourist trade. Paradoxically, a failure to report disease often has a worse effect, since the traveller prefers to be told a disease exists and how he can protect himself. If the traveller is in doubt whether a disease is present or not, particularly if the media give undue prominence to the situation, his tendency not to travel is greater. If WHO is officially informed promptly it can provide objective clarification to those concerned (including the media) and can help prevent the introduction of excessive measures or have them withdrawn so that the flow of tourists can be maintained with minimum interference.

The overall situation based on the reports received for 1981 is that fewer complaints are made concerning vaccination certificate requirements. With respect to smallpox vaccination certificates there has been considerable improvement since the last report, but there are still two sources of difficulty which require continued attention. First, the procedure adopted at some points of entry, particularly airports, is not consistent with the requirements of national health administrations as notified to WHO. And second, an even greater source of difficulty is that many embassies, consulates, high commissions, and so forth continue to provide information which is quite often contradictory to that furnished WHO by national health administrations. An effort is being made to resolve all instances of conflicting information with respect to vaccination certificate requirements; those situations involving smallpox certificates are considered extremely urgent and serious.

It is known that cholera vaccination will not prevent the introduction of the disease into any country. In addition, the IHR were amended in 1973 so that a cholera vaccination certificate may no longer be required of any traveller. One country has estimated the population at risk as being the number of returning nationals on commercial air carriers from Asia, Africa, or Oceania. On this basis, the chance of contracting cholera appears to be in the order of one case per 500,000 returning travellers.

Still more needs to be done in an organized and continuing manner by national health administrations to advise travellers of the health risks when visiting other countries. This task should be approached in an imaginative way since it involves the medical profes-