



# XV Pan American Sanitary Conference

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# X Meeting Regional Committee



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## Topic 23: STATUS OF SMALLPOX ERADICATION IN THE AMERICAS

The 34th Meeting of the Executive Committee (Washington, May 1958) decided that a topic on the status of smallpox eradication in the Americas be included on the agenda of the XV Pan American Sanitary Conference.

On the other hand, the Eleventh World Health Assembly adopted Resolution WHA11.54 on eradication of smallpox (Annex I), which the Director-General of WHO wishes to bring to the attention of all WHO regional committees. As will be seen in the first operative paragraph of that resolution, the Director-General has been requested to carry out a study for the Twenty-third Session of the WHO Executive Board, for which purpose he will need additional information that must necessarily be obtained from Member States. The Director-General expects the cooperation of all regional committees to ensure the speediest possible collection of such information so that the document for the Executive Board will be as realistic and useful as possible.

The above-mentioned resolutions reaffirm the importance that the governing bodies of WHO and PASO attach to the problem of smallpox. In presenting the following information, the Director hopes that it may serve as a basis for discussion of this topic at the Conference.

### 1. EXTENT OF THE PROBLEM

Smallpox is still an important public health problem in the Americas. Although in some countries the disease has been eradicated or reduced to a negligible level, in others it continues to be a subject of serious concern, as reflected in its rather high incidence, as indicated in the reports received by the Organization. According to the data available, in 14 countries and 4 other areas in the ten-year period 1948-57, about 129,000 cases of the disease were reported, with at least 18,000 deaths. In the same period, no cases were reported by 8 countries (Canada, Costa Rica, Dominican Republic, El Salvador, Haiti, Honduras, Nicaragua, Panama) and 17 other areas (Alaska, Bahamas, Barbados, Bermuda, British Honduras, Canal Zone, Falkland Islands, French Guiana, Guadeloupe, Hawaii, Jamaica, Leeward Islands, Puerto Rico, Saint Pierre and Miquelon, Surinam, U.S. Virgin Islands, Windward Islands).

Table I shows the geographical distribution of cases of smallpox reported in the period 1948-57, by years.

TABLE I - REPORTED CASES OF SMALLPOX IN THE AMERICAS

1948 - 1957

Area	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
Argentina	166	1,609	4,788	1,404	982	336	256	55	86	335
Bolivia	831	805	594	728	432	429	624	372	481	1,310
Brazil (a)	1,288	670	706	1,190	1,668	923	1,035	2,580	2,385	842(b)
Chile	5	4	2,744	47	15	9	-	-	-	-
Colombia	7,356	3,040	4,818	3,844	3,235	5,526	7,203	3,404	2,572	2,107
Cuba	-	3	-	-	-	-	-	-	-	-
Ecuador	3,892	664	251	174	665	708	2,516	1,831	669	913
Guatemala	6	4	10	3	1	1	-	-	-	-
Mexico	1,541	1,060	762	27	-	-	-	-	-	-
Paraguay	1,702	179	304	282	797	770	207	57	132	95
Peru	7,105	6,305	3,612	1,218	1,360	172	115	-	-	-
United States	57	49	39	11	21	4	9(c)	2(c)	-	-
Uruguay	-	9	3	-	16	7	1	45	42	2
Venezuela	6,358	3,951	2,181	280	109	72	13	2	4(d)	-
British Guiana	-	-	-	11	-	-	-	-	-	-
Martinique	-	-	-	1	-	-	-	-	-	-
Netherlands Antilles	-	-	3	1	-	-	-	-	-	-
Trinidad and Tobago	13	-	-	-	-	-	-	-	-	-

- No cases

(a) Data for the Federal District and state capitals, excluding:

Salvador 1953 and 1954; Niteroi 1955.

(b) Information incomplete.

(c) These cases do not fulfill the generally accepted criteria for a diagnosis of smallpox.

(d) Clinical diagnosis not supported by epidemiological evidence.

The table indicates that some countries, such as Mexico, Peru, and Venezuela, which had a high incidence of smallpox, have either eradicated the disease or reduced it to a very negligible level. Others, like Colombia, where the incidence is falling as the result of an eradication campaign, and Bolivia, Brazil, and Ecuador constitute important foci of the disease. As can be seen, most of the Central American and Caribbean regions have reported no cases of smallpox in the last ten-year period. However, since in many of those regions the number of vaccinations performed is relatively small, a great majority of the population is susceptible to the disease.

## 2. STATUS OF THE ERADICATION PROGRAM IN THE AMERICAS

Recognizing the extent of the problem, the XIII Pan American Sanitary Conference (Ciudad Trujillo, 1950) recommended the development of a program for the eradication of smallpox on a hemisphere-wide scale through systematic campaigns of vaccination and revaccination, to be carried out under the auspices of the Organization, in agreement with the interested countries.

In 1952 the VI Meeting of the Directing Council (Havana) authorized the amount of \$75,000, and in 1954 the XIV Pan American Sanitary Conference (Santiago) approved a supplementary amount of \$144,089, to be utilized for the coordination of a continental eradication program.

### Collaboration with Governments for the Production of Smallpox Vaccine.

As the first stage of this program, it was considered of the utmost importance to stimulate the production of a high quality vaccine capable of withstanding the effects of the difficult field conditions existing in large areas of the Hemisphere where facilities for transportation and refrigeration are scarce. For this purpose, various national laboratories were provided with the equipment necessary to produce dried smallpox vaccine, with the services of consultants specialized in this field. Technical information on the subject has been distributed, fellowships have been awarded to personnel for training in modern vaccine production methods, and the services of a recognized laboratory have been made available for testing the purity and potency of the vaccine produced by the national laboratories. Such collaboration has been given to Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, Ecuador, Mexico, Peru, Uruguay, and Venezuela.

Table II shows the amounts of smallpox vaccine, glycerinated and dried, produced by certain countries of the Americas for the years 1956 and 1957, according to the data received by the Organization.

Table II - Production of Smallpox Vaccine,  
in Doses, in 20 Countries of the Americas

1956 and 1957

Area	1 9 5 6		1 9 5 7	
	Glycerinated vaccine	Dried vaccine	Glycerinated vaccine	Dried vaccine
Argentina	8,342,500	...(a)	20,000,000	110,000
Bolivia	...	...	...	...
Brazil	12,000,000(b)	...	12,000,000	...
Chile	1,332,512	998,750	2,500,000	500,000
Colombia	4,436,125	170,000	6,688,300	550,600
Costa Rica	-	-	-	-
Cuba	...	...	190,000	...
Dominican Republic	-	-	-	-
Ecuador	335	1,093,325	...	942,425
El Salvador	20,234	-	221,500	-
Guatemala	200,700	-	...	...
Haiti	-	-	-	-
Honduras	...	...	312(c)	...
Mexico	12,068,630	31,000	9,482,820	9,500
Nicaragua	304,800	...	1,113(d)	...
Panama	-	-	-	-
Paraguay	-	-	-	-
Peru	...	...	865,365	2,101,200
Uruguay	2,621,050	271,500	1,500,000	110,000
Venezuela	3,849,500	100,000	...	...

(a) experimental stage  
(b) estimated number  
(c) cubic centimeters

(d) grains  
... data not available  
- no production

Since the production techniques used in various laboratories differed in several aspects, and control tests made by a qualified reference laboratory showed considerable variation in the quality of the vaccine produced, it was deemed advisable to convene a seminar of professionals engaged in vaccine production and control. This seminar met in Lima in August 1956, with the attendance of 19 participants and observers from 10 countries (Argentina, Brazil, Colombia, Cuba, Ecuador, El Salvador, Mexico, Peru, Uruguay, and Venezuela), together with some international consultants. The basic purpose of the meeting was to exchange ideas and experience and to discuss the different techniques of vaccine production, with special emphasis on dried smallpox vaccine. Attention was devoted also to the standardization of the techniques of vaccine control, to the laboratory methods for diagnosing smallpox, and to the results obtained with the use of different types of vaccine in vaccination campaigns. As a direct result of the seminar, several laboratories have improved their production techniques, and control testing is more uniform. Several technical documents presented at this seminar have been reproduced in the PASB Boletín and in a special publication <sup>1/</sup> which should be of value to all health workers.

#### Collaboration with Governments in Vaccination Campaigns.

As sufficient supplies of vaccine of good quality become available, the countries are devoting increased efforts toward achieving eradication of smallpox through active vaccination campaigns. The Organization has collaborated with various governments in the planning and development of these campaigns, either by providing the services of specialized consultants, by awarding fellowships for the training of national personnel, or by supplying limited amounts of equipment. A "Guide for Smallpox Vaccination Programs" was prepared and distributed in 1956.

Table III shows the number of smallpox vaccinations registered in several countries of the Americas for the years 1954 to 1957.

<sup>1/</sup> Publicaciones Científicas No. 29, March 1957.

Table III - Number of Primary Vaccinations and Revaccinations  
Registered in 20 Countries of the Americas, 1954 - 1957

Area	Year 1954	Year 1955	Year 1956	Year 1957
Argentina	...	...	117,862	...
Bolivia	226,036	505,443	270,948	...
Brazil	...	...	816,908(a)	...
Chile	498,234	605,704	783,188	...
Colombia	1,645,633	1,473,105	2,710,579	2,725,936
Costa Rica	...	...	13,046	...
Cuba	...	...	14,627	...
Dominican Republic	...	...	5,359	...
Ecuador	...	512,207	289,024	247,504
El Salvador	...	...	31,359	...
Guatemala	...	...	137,236	...
Haiti	...	...	4,185	116,732
Honduras	...	...	...	...
Mexico	1,221,200	1,243,690	4,693,174	...
Nicaragua	...	...	13,675	...
Panama	...	...	...	...
Paraguay	232,246	175,694	221,811	668,139
Peru	460,684	831,238	873,879	751,396
Uruguay	...	...	196,996	...
Venezuela	1,257,609	1,269,345	1,132,812	773,855(b)

... Data not available.

(a) Vaccination performed with vaccine distributed  
by the Ministry of Health only.

(b) January - July.

There follows a summary statement on the status of vaccination work in individual countries, with an indication of the difficulties that have prevented some of them from achieving early completion of the campaign.

In Argentina, plans are being made to expand the smallpox vaccination campaign throughout the entire country; mass vaccination activities have been initiated in some of the northern provinces. The glycerinated vaccine at present produced in the country is of good quality and sufficient in quantity to cover the national needs. The production of dried smallpox vaccine is still small.

In Bolivia, the nation-wide campaign is ready for implementation this year, using imported vaccine until the national production center is able to meet the demands. During 1957, several outbreaks of smallpox occurred in Cochabamba and in La Paz Department, and to combat these outbreaks emergency vaccination campaigns were conducted, using dried vaccine obtained from Chile and Peru. Up to March 1958, approximately 1,100,000 persons had been vaccinated. The International Cooperation Administration is actively collaborating in this program.

In Brazil, two laboratories for dried smallpox vaccine production are being established, and formal agreements have been signed for eradication campaigns to be carried out in the states of Rio Grande do Sul and Pernambuco.

In Chile, the eradication campaign, which was executed largely by the general local health services, has already covered the entire country. Activities to maintain the protection level in the population have been intensified, particularly in the rural areas, where smallpox vaccination is performed in conjunction with BCG immunization. Measures are also being taken to increase the production of dried smallpox vaccine in the country.

In Colombia, the nation-wide campaign was initiated in October 1955 with the aim of vaccinating 80 per cent of the population, or a total of 9,600,000 vaccinations, over a period of five years. As of June 1958, 3,428,181 persons had been vaccinated. With the increased production of dried vaccine at the Samper Martínez Institute, and the solution of certain administrative difficulties that have delayed the campaign, it is expected that the established goal will be achieved within the five-year period.

In Cuba, glycerinated vaccine of good quality is produced. The Government has contributed 500,000 doses to the regional programs and has announced a contribution of 2 million doses to the World Health Organization. No dried smallpox vaccine is being produced at present.

In Ecuador, plans have been completed for the nation-wide vaccination campaign, which it is expected will be under way by the time this document is distributed. The activities in this country were reorganized following outbreaks in 1957 that totalled 913 cases, including an outbreak in Quito.

The national laboratory is producing dried smallpox vaccine in sufficient quantity to meet the needs of the planned campaign.

In Haiti, the Government has taken advantage of the surveillance phase of the yaws campaign in order to implement a smallpox vaccination program, one that began in the principal cities of the country in 1957. Up to 116,732 vaccinations have been administered. The vaccine is being provided free of charge by Cuba, Mexico, Peru, and Venezuela.

In 1950 Mexico undertook a very active eradication campaign covering the entire national territory, with very successful results. No cases of smallpox have been reported since 1951. Adequate levels of immunity are being maintained through vaccination as a regular practice of the local health services. The production of dried smallpox vaccine, which is in initial stages, will be accelerated in 1958.

In Paraguay, the mass vaccination campaign, started in 1957, had covered almost 320,000 persons by May 1958, using vaccine produced abroad.

In Peru, the eradication campaign started in 1950 and has covered 6,931,183 persons, or 78.7 per cent of the country's population. The success of this well-organized campaign is demonstrated by the fact that no cases of smallpox have been reported from Peru since December 1954. Since the completion of the mass campaign, the local health services have assumed the responsibility for vaccination. The dried vaccine produced by the National Institute of Hygiene has been of good quality.

In Uruguay, a vaccination campaign has been organized in the area bordering with Brazil. Plans are being made to expand these activities in 1958 in order to cover the entire country. Measures for the installation of dried-vaccine production units are also being planned.

The campaign in Venezuela has been completed successfully throughout the national territory. Among the measures being taken to consolidate the results are plans to increase the production of dried smallpox vaccine and to integrate smallpox vaccination as a routine activity in the local health services.

### 3. CONCLUSIONS

The smallpox eradication campaign in the Americas is progressing more slowly than was first anticipated. In spite of the excellent results obtained by various countries that have completed eradication or reduced the incidence of smallpox to a negligible level, the disease is still an important public health problem in the Americas. The achievement of eradication throughout the Hemisphere requires the concentrated efforts of the countries concerned, both for the protection of their own populations and for the safety of other countries that have already taken the necessary steps to eradicate the disease. It is understood that in many countries the delay has been due to financial and administrative difficulties. Among



the major administrative problems are the timely acquisition of supplies and materials and the recruitment of a sufficient staff of well-disciplined and adequately remunerated workers. Obstacles resulting from inadequate transportation facilities and deficient systems for payment of travel expenses of field workers are also to be overcome.

The financial expenditure required for completion of the hemisphere-wide campaign to eradicate smallpox is relatively small when compared with the enormous costs of campaigns to eradicate other major diseases. Governments should be in a position to ensure the necessary provision in the national budgets for the prosecution of the eradication activities. In view of the high priority assigned to this program by the governing bodies, the Organization's budgets for future years will propose sufficient funds to give firm support to the campaigns undertaken by individual countries.

A completely effective weapon against this disease is available; it has been available for many years. Properly organized and systematic campaigns to administer smallpox vaccine to the population are measures sufficient to ensure complete protection against the disease. Through these measures, eradication can and should be achieved in the Americas.

There should, therefore, be special emphasis on the need for the countries to make every effort necessary to surmount all administrative or financial difficulties that may have delayed the antismallpox activities and to give to the smallpox eradication program the importance and priority it deserves from the point of view of national and international health.

Annex I: Resolution WHA11.54

RESOLUTION WHA11.54

ERADICATION OF SMALLPOX

The Eleventh World Health Assembly,

Noting that smallpox still remains a very widespread and dangerous infectious disease and that in many regions of the world there exist endemic foci of this disease constituting a permanent threat of its propagation and consequently menacing the life and health of the population;

Having regard to the economic aspect of the question, which shows that the funds devoted to the control of and vaccination against smallpox throughout the world exceed those necessary for the eradication of smallpox in its endemic foci and consequently the destruction of the sources from which the infection arises and spreads, and clearly indicates that the eradication of smallpox might in future make vaccination and all expenditures involved in its application redundant;

Taking into account the level of development reached by medical science and the health services in the control of infectious diseases, and in particular of smallpox, and the manifest tendency of the morbidity of smallpox to diminish in recent years;

Having regard to the decisions and pertinent practical measures adopted by WHO for the control and intensification of anti-smallpox programmes, in particular resolutions WHA3.18; EB11.R58; WHA6.18; EB12.R13; EB13.R3; WHA7.5; WHA8.38; WHA9.49, and

Considering it opportune to raise the problem of the world-wide eradication of smallpox in the near future;

1. REQUESTS the Director-General to study and report to the Executive Board at its twenty-third session on the financial, administrative and technical implications of a programme having as its objective the eradication of smallpox, the study to include the various problems involved in carrying out the following activities:

(a) investigation of the means of ensuring the world-wide eradication of smallpox, taking into account the fact that smallpox persists in certain areas despite repeated vaccination campaigns;

(b) encouragement of the preparation during 1958-1960 of the necessary amount of smallpox vaccine in national laboratories and institutes;

- (c) training of vaccinators among the local population in countries in which mass immunization campaigns will be conducted;
- (d) the pooling of experience and the formulation of recommendations for the production of a sufficient amount of thermostabile smallpox vaccine suitable for prolonged storage and use in tropical and subtropical regions of the world, and
- (e) study of the measures to be taken in order to avoid complications which might result from smallpox vaccination;

2. RECOMMENDS to all governments:

- (a) that during 1959-1960 the population be vaccinated in countries in which principal endemic foci of smallpox exist, and
- (b) that during 1961-1962 additional vaccination of the population should be carried out in foci where the disease persists, and that subsequently revaccinations be given to the extent it becomes necessary in accordance with the experience acquired in each country;

3. RECOMMENDS that all countries in which smallpox vaccination is compulsory continue to give smallpox vaccinations during the eradication of this disease throughout the world;

4. CALLS upon medical scientists and scientific institutions active in the field of microbiology and epidemiology to stimulate their efforts towards improving the quality and the technology of the production of satisfactory smallpox vaccine resistant to the influence of temperature, and

5. REQUESTS the Director-General to report to the Twelfth World Health Assembly on the progress made and the results obtained.

(Seventh plenary meeting, 12 June 1958,  
A11/VR/7)