

directing council



PAN AMERICAN
HEALTH
ORGANIZATION

XII Meeting

Havana, Cuba
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regional committee

WORLD
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Topic 20: STATUS OF SMALLPOX ERADICATION IN THE AMERICAS

1. Introduction

The XI Meeting of the Directing Council (1959) made a detailed study of the report presented by the Director (Doc. CD11/14) on the problem of smallpox in the Americas. As a result of the discussions, the Council expressed its satisfaction at the fact that in some countries smallpox has already disappeared, and that in others nation-wide and intensive smallpox vaccination programs are being conducted; recommended that the governments give special attention to the continuation of programs directed toward the maintenance of high level of immunity, in order that the success obtained may be made permanent; called upon the governments of countries where smallpox still exists and where nation-wide smallpox vaccination programs have not yet been initiated, to undertake such programs as soon as possible; and recommended that the governments study ways and means of producing and storing adequate supplies of smallpox vaccine for use in national programs for vaccination and for control of possible outbreaks, and furnish the Bureau the information needed to keep up to date a record of the supplies of vaccine available for use in the control of any new smallpox outbreak or in any emergency situation that might arise in any country.

The Thirteenth World Health Assembly considered the report of the Director-General of the WHO on the problem on a world-wide scale and adopted Resolution WHA13.53, the text of which is presented as Annex I to this document.

Bearing in mind the interest of the Governing Bodies of the Organization in the problem and its importance to public health in the Western Hemisphere, the Director has considered it advisable to present the following report to the XII Meeting of the Directing Council for consideration.

2. Definition of Smallpox Eradication

In compliance with the **mandate** given by the XI Pan American Sanitary Conference, the Bureau has continued the studies and consultations necessary to establish a definition of "smallpox eradication."

As indicated in the resolution of the Conference, such a definition should be suitable for universal application, so that there may be a single criterion for judging when the countries have reached the ultimate goal in the fight against this disease. To this end, the Bureau has held consultations with authorized persons in various countries and has maintained close contact with WHO, which is also attaching much importance to the problem.

As a result of these consultations, the Bureau submitted to the WHO for consideration the following tentative statement:

"For practical purposes, smallpox can be considered eradicated from countries where it has been persistently present, when no cases of smallpox occur during three consecutive years after an adequate vaccination campaign.

Although varying conditions in different countries might determine changes in the way of conducting the eradication programs, it is generally agreed that the correct vaccination of 80 per cent of each sector of the population within a period not exceeding five years, will result in the dying out of smallpox.

The countries where smallpox has been eradicated should adopt measures for maintaining the eradication status either through a permanent program of immunization or through the appropriate combination of isolation and immunization whenever the disease is reintroduced in the country. Countries under great risk of smallpox introduction -- endemic situation in neighboring countries, for example -- are recommended to maintain a high level of immunity in the population by means of (a) vaccination of the new accessions to the population (newborn children and immigrants), and (b) periodic revaccination of the more exposed sectors of the population."

The Conference on Smallpox scheduled to be held in November at New Delhi under the auspices of WHO, will be attended by participants from countries included in the Regions of the Eastern Mediterranean, Southeastern Asia, and the Western Pacific, who will study among other subjects that of the definition of smallpox eradication. Thus, the WHO will have available broader viewpoints on the subject from which to propose universally acceptable criteria. The WHO will continue to study the definition of smallpox eradication until a final text is obtained that is acceptable to all the Regions.

3. Extent of the Problem

Smallpox continues to be a serious public health problem in the Continent, as is indicated by its presence in a number of countries, some of which show high rates of incidence. According to available data, in the ten-year period 1950-59, 15 countries and other areas reported 88,618 cases. In the same period, no cases were reported by 7 countries (Canada, Costa Rica, Dominican Republic, El Salvador, Haiti, Honduras, and Nicaragua) or by 15 other areas (Bahamas, Barbados, Bermuda, British Honduras, Falkland Island, French Guiana, Guadeloupe, Jamaica, Leeward Islands, Panama Canal Zone, Puerto Rico, Saint Pierre and Miquelon, Surinam, Virgin Islands, and Windward Islands).

Table A shows the annual geographic distribution of smallpox cases reported to the Bureau in the period 1950-59. This table indicates that in some countries, such as Chile, Mexico, Peru and Venezuela, no cases of the disease have been reported in recent years, except in Chile, where an autochthonous case occurred in 1959 resulting from imported cases; and that in others, such as Bolivia, Colombia, and Paraguay, the number of reported cases has been decreasing to such an extent that in 1959 the disease was not reported in Paraguay. Such progress is due to the intensive campaigns carried out by those countries. As can be seen, no cases have occurred in the past five years in Central America and the Caribbean area, with the exception of Panama, which in 1958 had an outbreak of 8 cases in a town bordering on Colombia. However, since in many of these countries and areas the number of vaccinations applied is relatively small, an important proportion of the population is susceptible to the disease.

In 1959 Ecuador and Brazil reported the highest figures for smallpox. The disease is endemic in both countries, with frequent outbreaks in different geographical areas. A solution to the problem in such areas is fundamental to the success of the program for eliminating the disease from the American Continent.

4. Present Status of the Program

The Organization has continued to promote and to cooperate with the Member Governments in the planning of smallpox eradication programs through vaccination campaigns that will eventually be incorporated in the general structure of national public health services. Technical advice has been provided in the production of smallpox vaccine and equipment was supplied to prepare dried vaccine. In other cases assistance has been given in obtaining prepared vaccine ready for use, services were provided of consultants specialized in conducting vaccination campaigns, and fellowships were awarded for the training of national personnel. Finally, the governments have available the services of an accredited laboratory to test the purity and potency of the vaccines produced by the national laboratories.

Table B shows the most recent data received by the Bureau on vaccinations applied in 1959 and the first four months of 1960; and Table C contains the data on vaccine production during the same periods.

A summary of the status of activities developed in the various Member Countries is given below.

In Argentina the Ministry of Public Health organized meetings in the Provinces of Salta, Jujuy, and San Juan in order to discuss with the health personnel of those provinces their smallpox eradication campaigns, as a basis for planning the program on a nation-wide scale. For this purpose, negotiations have been undertaken to extend the agreement between the Government

and PASB. There were 34 cases of smallpox in 1959 and 5 during the first half of 1960, located, mainly, in the northern and central areas of the country. The present production of glycerinated vaccine is sufficient (4,099,400 doses in 1959 and 1,943,200 doses during the first four months of 1960) to meet the country's requirements.

In Bolivia several outbreaks occurred in 1957 in Cochabamba and in La Paz Department, as a result of which emergency vaccination campaigns were carried out, with dried vaccine obtained from Chile and Peru. Immediately thereafter, a nation-wide program was undertaken with the aim of immunizing a minimum of 80 per cent of the country's total population. The vaccine was provided by the Institut de Vaccine of Paris and by the National Institute of Health of Peru. The program included one attack phase, during which vaccinations should be applied in the larger population centers accessible by highways and railways; another phase of consolidation, during which the vaccinations would be applied to the rest of the country; and the final phase of maintenance and surveillance. The first phase was fulfilled in a regular manner during 1957 and 1958. The second was only partially completed, as an important number of provinces was not covered that have a population of some 660,000 inhabitants and where, so far, adequate immunization has not been achieved. Despite this, great success was achieved as in 1959 only 7 cases of smallpox were reported. For financial reasons the program was interrupted in December 1959. The need is urgent to resume the smallpox vaccination activities, otherwise there is the risk of losing the ground gained so far.

From August 1957 to December 1959, 2,758,567 vaccinations were applied. The International Cooperation Administration of the United States has collaborated actively in this program. The dried vaccine production laboratory, for which equipment was provided by the Organization, entered the production stage and turned out 543,800 doses of vaccine in 1959.

The Government of Brazil has approved a national plan for smallpox eradication and has started activities in the States of Maranhão, Alagôas, Rio de Janeiro, Paraná, Rio Grande do Sul, and Goiás. The Organization has sent equipment for the dried vaccine production laboratories in the States of Rio Grande do Sul and Pernambuco. An offer was made also of additional equipment to expand the laboratory at the Oswaldo Cruz Institute. A fellowship was awarded to a professional for visits to scientific centers that produce dried vaccines. A total of 4,139,872 persons were vaccinated in 1958, and 2,129,232 during the first half of 1959. The production of glycerinated vaccine during the same periods was 8,196,555 and 6,219,622 doses, respectively.

In Chile the regular vaccination program is the responsibility of the local public health services. In 1959, as a result of 3 imported cases and one autochthonous smallpox case, the authorities conducted an intensive vaccination program, having immunized 1,500,000 persons within one month.

From 1955 through 1959, 6,123,409 vaccinations (1,125,469 primovaccinations and 4,997,940 revaccinations) were applied in a population estimated as of 30 June 1959 at 7,465,000 inhabitants, which represents the immunization of 80 per cent of the country's entire population. The regular program consists in vaccinating all nursing babies and immigrants and revaccinating 20 per cent of the population every 5 years. The smallpox vaccine production laboratory of the Bacteriological Institute, for which the Organization provided additional equipment in 1958, has increased its production, which in 1959 reached 7,850,000 doses of glycerinated vaccine and 1,310,000 doses of dried vaccine; during the first 4 months of 1960, the figures were 250,000 and 210,000, respectively.

In Colombia the national campaign was started in October 1955 with the aim of vaccinating within 5 years 80 per cent of the population, estimated at 13,529,628 inhabitants. Smallpox vaccination is expected to be incorporated in the activities of the local public health services, on a rational and systematic basis, in order to maintain permanently the immunity level of the population. The Organization has been providing the services of a consultant to cooperate with the national authorities in the development of the program. It also furnished the services of a consultant specialized in dried vaccine production, as well as fellowships to three professionals for the study abroad of vaccine production and the organization and operation of vaccination campaigns. UNICEF provided equipment for the production of dried vaccine. Since the beginning of the program, a systematic house-to-house vaccination campaign has been carried out in the Department of Norte de Santander, Santander, Boyacá, Cundinamarca, the Special District of Bogotá, Tolima, Valle, Caldas, Huila, Cauca, Antioquia, and Narinó. As of March 1960, 8,063,794 persons had been vaccinated. The 3,425,177 inhabitants of 12 Departments remain to be immunized, which may be achieved during the early months of 1961, depending upon whether the present rate of 70 vaccinations per vaccinator-day can be continued with the same 20 inspectors and 40 vaccinators.

The campaign is under the immediate direction of a national coordinator and three zone physicians. A careful case-reporting service has been organized and all cases detected, so long as they belong to the vaccinated areas, are visited by physicians in order to confirm the diagnosis on the basis of clinical and epidemiological evidence, as well as by laboratory examinations, whenever possible. The Samper Martínez Institute produced 4,511,600 doses of dried vaccine in 1959 and 952,825 doses in the early months of 1960.

Cuba is producing sufficient glycerinated vaccine to meet the country's needs, as well as small amounts of dried vaccine. The Organization had provided the necessary equipment for larger-scale production of this type of vaccine, and a consultant is scheduled to visit the country soon to cooperate with the national authorities in achieving this goal. The Government has

offered 500,000 doses of glycerinated vaccine to the regional program and has announced another contribution of two million doses to the world-wide program sponsored by WHO.

In Ecuador smallpox constitutes a serious public health problem as 1,184 cases were reported in 1959 and 910 during the first six months of 1960. The program was started with the goal of vaccinating 80 per cent of the country's population within a maximum period of five years. As of April 1960, 934,766 vaccinations had been applied, of which 403,964 were in the Province of Pichincha (87 per cent of the population) and 530,802 in the Province of Guayas (68 per cent of the population). There remain 16 provinces with areas of difficult access and where the population is dispersed over extensive mountainous and coastal areas. The campaign has been developed most irregularly, with frequent and prolonged interruptions, resulting in a low yield and few vaccinations, owing mainly to the lack of funds to pay salaries and per diem, and maintenance of transport vehicles.

It is hoped that these difficulties will soon be overcome so that the program may achieve the planned objective. The Organization is collaborating by providing the services of a permanent consultant. The National Institute of Health produced 1,210,820 doses of dried vaccine in 1959 and 345,940 during the first four months of 1960.

In Haiti the Government took advantage of the surveillance phase of the yaws eradication campaign to implement a smallpox vaccination program, which started in 1957 in the principal cities of the country. Unfortunately, for administrative reasons, this program was interrupted in 1958 and it has not been possible to continue vaccinations in the rural areas. The number of vaccinations applied was 443,119 and the vaccine utilized was supplied free of charge by Cuba, Mexico, and Venezuela.

In Mexico, as the result of a campaign that covered the entire national territory, no cases of smallpox have occurred since 1952. Adequate levels of immunity are maintained through regular vaccinations carried out by the local public health services. In 1958, 5,000,000 persons were vaccinated. The Organization has provided equipment for the preparation of dried vaccine, as well as the services of a consultant specialized in the large-scale production of this type of vaccine. Mexico has large amounts of glycerinated vaccine (12,000,000 doses produced in 1958); and it was announced at the Twelfth World Health Assembly that five million doses had been placed at the disposal of the Organization.

In Paraguay the vaccination campaign was started in September 1957 with a view to vaccinate at least 80 per cent of the country's population within three years. In February 1960 the campaign was considered to be completed, during which 1,462,904 persons had been immunized, which represent 86,7 per cent of the estimated population as of 30 June 1959. Of the total number of

persons vaccinated, 221,345 or 15 per cent were primovaccinations. The campaign used glycerinated vaccine produced in Uruguay, the multipressure technique and the method of vaccinating numerous small groups of inhabitants having been employed. The regular public health services are responsible for maintaining an adequate immunity index. No cases of smallpox have been reported since June 1958.

In Peru, with the collaboration of the Organization, the eradication campaign was started in October 1950. A total of 7,672,892 persons, or 87 per cent of the country's population, had been vaccinated. The results of this well-organized campaign are evidenced by the fact that no cases have occurred in the country since December 1954. Persons vaccinated totalled 1,273,017 in 1958 and 441,445 in the first half of 1959. The National Institute of Health produced 3,896,255 doses of dried vaccine and 932,100 of glycerinated vaccine in 1958, and approximately these same figures have been maintained during 1959 and so far in 1960.

In Uruguay a vaccination campaign was organized in the area bordering on Brazil, and plans were made to extend the campaign to the entire country, but owing to certain legal implications, the agreement covering collaboration with the Organization could not be signed. The laboratory of the Municipality of Montevideo produced 2,100,000 doses of glycerinated vaccine. Equipment for the production of dried vaccine was provided by the Organization. In 1958, 102,054 persons were vaccinated, and in the first half of 1959, 34,553 persons. During the first half of 1960, 18 cases of smallpox occurred.

In Venezuela the Government carried out a campaign throughout the national territory, and no cases of smallpox have occurred since 1957. To consolidate the results achieved, the production of dried vaccine was increased (the Organization provided the necessary equipment), and also the incorporation of the smallpox vaccination work in the regular activities of the local public health services was started. In 1958, 862,585 persons were vaccinated, and in the first half of 1959, 344,300 persons. Vaccine production in 1958 was 6,000,000 doses of glycerinated vaccine and 200,000 of dried vaccine.

5. Final Considerations

The smallpox eradication campaign in the Americas is progressing, although at a slower pace than is desirable. It is essential to intensify the efforts of the countries where the disease persists, both for the protection of their own inhabitants and for the safety of other countries where the disease is either eradicated or about to be so.

In some countries, the delay in activities has been due to financial and administrative difficulties, among which are lags in the acquisition of supplies and equipment, shortage of well-disciplined and adequately remunerated

workers, lack of adequate transportation facilities, and deficient systems for paying travel expenses of field workers.

The expenditures required for the successful completion of the hemisphere-wide campaign to eradicate smallpox are relatively small when compared with the campaigns to eradicate other major diseases. It is to be hoped that the governments will make an effort to include the necessary allotments in their national budgets.

In order to obtain adequate evaluation of the results of the campaigns, it is recommendable that the countries assure the provision of laboratory diagnosis of suspect smallpox cases, which becomes more necessary as the advances stages of the eradication programs are being completed.

For more than 150 years there has been available, to combat this disease, an effective vaccine which, when properly and systematically applied, will ensure complete protection of the population. There is no doubt that the eradication of smallpox can be, and should be, achieved in the Americas.

The Governing Bodies of the Organization have repeatedly stated the need for eliminating smallpox, once and for all, from the Western Hemisphere. The Bureau has been collaborating in this aim and is prepared to continue serving the Member Governments, with every means at its command, in order that this ultimate goal may be attained within the shortest time possible.

TABLE A

REPORTED CASES OF SMALLPOX IN THE AMERICAS, BY COUNTRY, 1949-1959

Area	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
Total	18,352	20,815	9,221	9,301	8,957	11,979	8,348	6,371	5,836	4,343	3,447
Argentina	1,609	4,788	1,404	982	336	256	55	86	335	27	34
Bolivia	805	594	728	432	429	624	372	481	1,310	183	7
Brazil (a)	670	706	1,190	1,668	923	1,035	2,580	2,385	1,017	1,232	1,354 (e)
Chile	4	2,744	47	15	9	-	-	-	2	-	1
Colombia	3,040	4,818	3,844	3,235	5,526	7,203	3,404	2,572	2,145	2,009	867
Cuba	3	-	-	-	-	-	-	-	-	-	-
Ecuador	664	251	174	665	708	2,516	1,831	669	923	863	1,184
Guatemala	4	10	3	1	1	-	-	-	-	-	-
Mexico	1,060	762	27	-	-	-	-	-	-	-	-
Panama	-	-	-	-	-	-	-	-	-	-	-
Paraguay	179	304	282	797	770	207	57	132	103	b) 8	-
Peru	6,035	3,612	1,218	1,360	172	115	-	-	-	21	-
United States	49	39	11	21	4	c) 9	c) 2	-	c) 1	-	-
Uruguay	9	3	-	16	7	1	45	42	2	-	-
Venezuela	3,951	2,181	280	109	72	13	2	d) 4	-	-	-
British Guiana	-	-	11	-	-	-	-	-	-	-	-
Martinique	-	-	1	-	-	-	-	-	-	-	-
Netherlands Antilles	-	3	1	-	-	-	-	-	-	-	-

- (a) Data for the Federal District and state capitals, excluding: Salvador 1953 and 1954; Niteroi 1955.
 (b) Including 4 imported cases.
 (c) These cases do not fulfill the generally accepted criteria for a diagnosis of smallpox.
 (d) Clinical diagnosis not supported by epidemiological evidence.
 (e) Data up to August 1959. Includes only the Federal District and state capitals.

TABLE B
SMALLPOX VACCINATIONS

Country	1958	1959	1960 January-April
Argentina	751,591	1,280,486	91,632 (1)
Bolivia	2,432,186	422,945	7,500
Brazil	4,139,772	7,856,294	
Chile	628,325	2,778,686	926,800
Colombia	2,557,615	2,643,381	499,967
Costa Rica	25,395	15,820	7,467
Cuba	7,996	25,083	11,742
Dominican Republic	4,511	5,027	7,334
Ecuador	301,112	546,667	160,470
El Salvador	43,620	32,818	10,120
Guatemala	99,200	34,428	21,472
Haiti	443,119	--	30
Honduras	32,328	12,824	3,007
Mexico	3,089,701	5,287,714	682,521
Nicaragua	10,108	10,521	2,825
Panama	48,610	33,108	--
Paraguay	594,003	589,316	78,766 (2)
Peru	1,273,017	824,100	135,571
Uruguay	102,054	87,324	76,022
Venezuela	862,585	1,060,850	494,410

(1) Data January-March 1960

(2) Incomplete data

TABLE C

PRODUCTION OF SMALLPOX VACCINE 1958-1960

(Number of doses)

Country	1958		1959		January-April 1960	
	Glycerinated Vaccine	Dried Vaccine	Glycerinated Vaccine	Dried Vaccine	Glycerinated Vaccine	Dried Vaccine
Argentina	6,500,000	83,000	4,099,400	60,000	1,943,200	-
Bolivia	-	37,000	-	543,800	300,000	-
Brazil	8,196,555	-	17,217,090	-	3,727,000	-
Chile	862,500	885,000	7,850,000	1,310,000	250,000	210,000
Colombia	2,125,800	4,087,980	-	4,511,600	-	952,825
Costa Rica	-	-	-	-	-	-
Cuba	180,00	-	210,000	-	110,000	-
Dominican Republic	-	-	-	-	-	-
Ecuador	161,830	337,900	-	1,210,820	-	345,940
El Salvador	210,000	-	50,000	-	9,290	-
Guatemala	92,345	-	230,900	-	138,800	-
Haiti	-	-	-	-	-	-
Honduras	31,100	-	20,200	-	-	-
Mexico	8,819,023	-	20,859,300	-	5,278,000	-
Nicaragua	35,880	-	15,100	-	-	-
Panama	-	-	-	-	-	-
Paraguay	-	-	-	-	-	-
Peru	932,100	3,896,255	1,029,400	2,735,610	113,000	-
Uruguay	2,100,000	-	1,726,700	-	676,200	-
Venezuela	6,000,000	200,000	4,751,000	217,000	1,430,000	103,000

RESOLUTION WHA13.53

SMALLPOX ERADICATION

The Thirteenth World Health Assembly,

Having considered the report of the Director-General on the progress of smallpox eradication programmes in the countries where the disease is still present,¹

Noting:

(1) that progress is being made towards smallpox eradication in certain countries where effective steps have been taken;

(2) that eradication campaigns have, however, not yet started in other countries with endemic foci of the disease, owing to local administrative and financial difficulties; and

(3) that technical assistance for the planning and organization of eradication campaigns is being offered by the Organization to all countries concerned,

1. EMPHASIZES the urgency of achieving world-wide eradication;
2. URGES the health administration of those countries which have not yet started eradication campaigns to make all efforts necessary to surmount the administrative and financial difficulties that may exist and to give the smallpox eradication programme the high priority it deserves;
3. REQUESTS the Director-General:
 - (1) to continue to provide under the programme and budget of future years for the assistance requested by national health administrations in organizing and developing smallpox eradication programmes and for all necessary activities to further this end;
 - (2) to report to the Fourteenth World Health Assembly on the progress of eradication programmes in all countries concerned.

Eleventh Plenary Meeting, 19 May 1960
A13/VR/11

¹ Document A13/P and B/11.