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STATUS OF SMALLPOX ERADICATION IN THE AMERICAS

In a series of resolutions -fifteen in all- approved in successive years since 1949, the Governing Bodies of the Organization have expressed their concern about smallpox in the Americas and their desire to eradicate this disease from the Western Hemisphere.

In fulfillment of the mandate of the Governing Bodies, the Organization has been actively engaged since 1950 in the development of a continental program for the eradication of smallpox as available resources permit.

The Organization has continued to cooperate with the Governments in the planning, execution and evaluation of smallpox eradication programs based on vaccination campaigns which can in due course be incorporated into the general public health services of the countries. This aid has consisted in the rendering of technical advisory services, the training of local personnel and the provision of equipment for the production of freeze-dried vaccine, and the Governments have been provided with the services of an officially recognized laboratory for the purity and potency testing of smallpox vaccine prepared by laboratories in their countries.

Notable progress has been made since 1950 toward the eradication of the disease. This progress varies considerably from one country to another and, while some have achieved the goal of total eradication and some are approaching it, there are still others where smallpox persists.

Smallpox foci in the Americas not only constitute a problem for the countries in which they are located, but also threaten and are a source of unending concern to those that are free of it and are compelled to sustain costly efforts to maintain the immunity of their populations at a high level. The recurrence of smallpox, or the threat of such recurrence, has impelled certain countries free of the disease to repeat nation-wide vaccination campaigns. The foci of smallpox in the Americas are, in descending order of importance, Brazil, Argentina, Paraguay, Colombia, and Peru.

Experience has shown that the disease can be rapidly eradicated by the intensification of systematic vaccination programs. No insurmountable technical difficulties have been encountered. The fact that certain countries have been unable to develop programs and that others run into difficulties in their eradication efforts is chiefly due to a lack of the necessary funds with which to hire personnel and obtain supplies or to shortcomings in the conduct of vaccination campaigns or in the setting up of a proper surveillance or maintenance service.

On the completion of a survey to evaluate the smallpox situation in the countries of the region, the Organization presented to the XVII Pan American Sanitary Conference a report on the results of the study which described the kind of international assistance requested from the PAHO/WHO by the countries for the study, organization, execution, and evaluation of smallpox eradication programs, national smallpox vaccination campaigns, maintenance programs and programs to organize epidemiological surveillance services and an over-all eradication plan. The general features of the plan are described in Document CSP17/20, Rev. 1. They are as follows:

1. Vaccination of the population in countries where smallpox is present. Argentina, Brazil, Colombia, Paraguay, and Peru are in this group. An eradication program is in progress in Bolivia. Because of an outbreak of smallpox in 1964 and because it lies between two countries where the disease is endemic, Uruguay is also included in this category.

2. The organization or continuation, as appropriate, of maintenance and epidemiological surveillance programs in countries bordering on countries where smallpox occurs and in which the disease has already been eliminated through well-conducted smallpox vaccination programs. The countries in this group are Chile, Ecuador, and Venezuela.

3. In countries where there is no smallpox but which are not in group (2) it is recommended that the necessary security measures be taken to avert the introduction and spread of the disease if the population is exposed to the risk of infection. It would be well if this group of countries were to endeavor to raise the level of immunization against smallpox among the population, preferably through the national health services and as part of broader immunization programs.

Priority in international assistance should be given to the countries where smallpox is present, already referred to in (1), above, and thereafter to the countries in group (2).

Smallpox eradication programs should be carried out in not longer than 4 years, at the end of which time the disease should have been eliminated with the conclusion of the attack phase, and the maintenance and epidemiological surveillance programs should be in full swing and cover every part of each country. For optimum results, it is important that the conduct of the programs in the individual countries be synchronized.

The total cost of the smallpox eradication program in the Americas has been estimated at US\$16,081,121, of which 84.65% (US\$13,610,841) would be contributed by the countries and 15.35% (US\$2,470,284) by international sources.

The Conference took note of Document CSP17/20, Rev. 1, Addendum I, on the status of smallpox eradication in the Americas and the estimated requirements for achieving it, and urged the Director of the Pan American Sanitary Bureau to provide the countries with material assistance in accordance with the budgetary resources available, and that it be furnished to the Governments as the progress of the program requires it and in keeping with the needs of each of the stages of the program.

The Nineteenth World Health Assembly (Resolution WHA19.16 Official Records of the World Health Organization, 151, 8), recognizing the need to augment resources and to co-ordinate the smallpox eradication programs of individual countries, decided that "the participation of the Organization in the smallpox eradication program should be financed from the ordinary budget of the Organization" and urged "countries which plan to strengthen or initiate smallpox eradication programs to take the necessary steps to begin the work as soon as possible." An amount of US\$2,674,000 has been included in the WHO ordinary budget for the 1967 program and it is proposed to allocate US\$2,820,000 to continue and strengthen the program in 1968. Of these amounts, US\$670,000 is earmarked for AMRO in 1967 and US\$695,000 in 1968.

In compliance with this Resolution, the Bureau has begun consultations with the interested Governments for the necessary detailed planning and other preliminary work to enable the Organization to make the best possible use of the funds approved.

A regional advisor for smallpox was appointed in March 1967 to supervise the eradication program in the Americas. Three medical officers and a statistician were also appointed and will cooperate with the health authorities in Brazil on the national eradication campaign. Medical officers and statisticians for Zones IV and VI, and Headquarters are being recruited.

A third course in laboratory diagnosis will be given in October in São Paulo, Brazil, to help develop auxiliary laboratory services. Two similar courses were conducted from 16 to 29 October 1966 under the sponsorship of the Organization and in collaboration with the National Communicable Disease Center (CDC-USPHS) and the Adolfo Lutz Institute of the Department of Health and Social Welfare of São Paulo, Brazil. As a result of these courses, which were attended by a total of 15 experts, there are in Latin America today eleven (11) laboratories capable of performing the minimum procedures for the laboratory diagnosis of smallpox described in Annex I. The Organization is exploring the possibility of selecting one or two of them as regional reference laboratories for smallpox.

The Organization has signed agreements with the Governments of Argentina, Bolivia, Brazil, and Colombia for smallpox eradication programs, and similar agreements are being negotiated with the Governments of Paraguay, Peru, and Uruguay. The Government of Chile has also signed an agreement with the Organization for a maintenance and epidemiological surveillance program.

One of the most important aspects of the eradication program is the provision of a sufficient supply of high-quality, fully stable freeze-dried smallpox vaccine. In recent years the Organization has actively encouraged the establishment of vaccine-producing laboratories in various countries. With the help of the Organization, several countries are producing enough vaccine not only to meet their own needs, but to supply non-producing countries as well. The Organization provides the countries with advisory services, fellowships for training in vaccine production, and supplies and equipment.

Some countries do not make sufficient use of the services offered to them for testing the vaccine produced in their local laboratories, and some of them are encountering production difficulties, certain batches failing to meet the minimum standards for potency, safety, and stability set by the WHO for high-quality vaccine. If these high standards are to be maintained, the countries must test their vaccines systematically. The Organization is prepared to help laboratories producing smallpox vaccine to operate properly, and to this end has secured from the University of Toronto the services of the Connaught Medical Research Laboratories, which will offer advice and cooperation in the production and testing of smallpox vaccine, including the training of local medical and paramedical personnel. Experts from these Laboratories will make periodic visits to vaccine-producing centers.

The first visit by Connaught experts, made in April, was to the freeze-dried vaccine-producing laboratories of Brazil, following which they made the necessary technical recommendations to assure that the vaccine conforms to the minimum standards set by the WHO. A new visit was begun in June, this time to the vaccine-producing laboratories in Zones IV and VI: Argentina, Bolivia, Colombia, Ecuador, Peru, and Uruguay.

About 36.5 million doses of freeze-dried vaccine have been produced annually since 1964 except last year, when output declined appreciably as a result of the flood in Rio de Janeiro, which reduced the generation of electric power and thereby the production capacity of the Oswaldo Cruz Institute (from 27 to 9 million). This year, production at the Oswaldo Cruz Institute has returned to normal and with the production of Argentina, calculated at 12,000,000 doses per year, the Region will cover its basic needs for freeze-dried vaccine. Annex II shows the output of vaccine-producing countries in 1964, 1965, and 1966.

A detailed Plan of Operations for the Eradication Campaign in each country is being prepared with the assistance of the Organization. It is on the basis of this Plan of Operations that the countries will be provided with the vehicles, equipment and supplies they need for their smallpox eradication programs. Special emphasis should be given to good vaccination coverage (90% of the existing population), good supervision, maintenance of the program and the reading of sample of the vaccinated population for the evaluation of the "takes" in primo-vaccinations and revaccinations.

The Organization had translated into Spanish and Portuguese a manual prepared by the National Communicable Disease Center (CDC-USPHS) on the use and repair of jet injectors (Ped-O-Jets), which are being used in the smallpox eradication programs, and the operating instructions for the Dermo-Jet in use in the experimental vaccination programs of Central America, the Caribbean, and Peru.

The Organization arranged with the National School of Public Health of the Ministry of Health of Brazil and with the country's National Smallpox Eradication Campaign for the conduct of a pilot study on the efficiency of Dermo-Jet injectors in vaccination campaigns; in this study the population was reached in various ways, either by house-to-house calls or at assembly points. Ten Dermo-Jets were sent to Brazil for this experimental program.

In April a meeting was held in Alexandria, Egypt, to complete the preparation of a Manual of Operations for Smallpox Eradication Campaigns. It will be distributed to interested countries to provide them with standard basic information for their campaigns. The present and the former Regional Smallpox Advisor attended the meeting; it is expected that the manual will very soon be translated into Spanish, Portuguese, and French. The Manual discusses various aspects of the work program, notably: Planning and conduct of operations, smallpox and the general health services, evaluation, maintenance, technical considerations, clinical and laboratory diagnosis. It is a contribution of major importance to smallpox eradication programs, which will necessarily have to be adapted to the peculiar conditions of each country inasmuch as the subjects are treated in a general way.

Tables III and IV show the figures for smallpox cases reported in 1965, 1966 and known cases in Brazil up to 6 May 1967, and also for total vaccinations performed in 1966.

TABLE I

LABORATORIES QUALIFIED TO DIAGNOSE SMALLPOX IN LATIN AMERICA

Laboratories

Argentina:	<u>Buenos Aires:</u>	National Institute of Microbiology Carlos Malbrán
	<u>Cordoba:</u>	
Brazil:	<u>Rio de Janeiro:</u>	Oswaldo Cruz Institute
	<u>São Paulo:</u>	Adolfo Lutz Institute
	<u>P. Alegre:</u>	Biological Research Institute
Chile:	<u>Santiago:</u>	Bacteriological Institute
Colombia:	<u>Bogota:</u>	National Institute of Health
Cuba:	<u>Havana:</u>	National Institute of Health Epidemiology and Microbiology
Ecuador:	<u>Guayaquil:</u>	National Institute of Health
Peru:	<u>Lima:</u>	National Institute of Health
Venezuela:	<u>Caracas:</u>	National Institute of Health
U.S.A.: *	<u>Atlanta, Ga.</u>	National Communicable Disease Center (USPHS)
Jamaica:	<u>Kingston:</u>	Dr. Grant Laboratory of Microbiology University of the West Indies
Canada:	<u>Halifax:</u>	Division of Laboratories, Department of Public Health
	<u>Montreal:</u>	Institute of Microbiology and Hygiene, University of Montreal, Laval des Rapides
	<u>Ottawa:</u>	Virus Laboratories, Laboratory of Hygiene, Department of National Health and Welfare
	<u>Toronto:</u>	Ontario Public Health Laboratories, Department of Health
	<u>Winnipeg:</u>	Department of Bacteriology and Immunology, University of Manitoba
	<u>Saskatchewan:</u>	Division of Laboratories, Department of Public Health, Regina
	<u>Edmonton:</u>	Provincial Laboratory of Public Health University of Alberta
	<u>Vancouver:</u>	Division of Laboratories, Health Branch, Department of Health and Welfare

* A further 35 State and University laboratories are qualified to diagnose smallpox.

TABLE II
SMALLPOX VACCINE PRODUCTION
1964 - 1965 - 1966

Country	D o s e s 1964		D o s e s 1965		D o s e s 1966	
	Glycerinated	Freeze-dried	Glycerinated	Freeze-dried	Glycerinated	Freeze-dried
Argentina	5,190,000 ^a	-	13,310,000	-	13,890,000	-
Bolivia	-	813,700	-	986,000	-	1,800,000
Brasil	-	27,040,878	500,000	27,000,000	180,380	9,386,200
Chile	3,075,000 ^b	582,500	3,000,000	400,000	4,000,000	36,500
Colombia	-	2,882,500	-	4,633,000	-	2,535,000
Cuba	660,600	-	555,850	-	384,750	-
Ecuador	-	715,004	1,512,280	-	-	2,019,800
El Salvador	-	-	180,000	-	31,878	-
Guatemala	1,417,165	-	379,500	-	455,300	-
Mexico	10,754,400	-	10,447,409	-	8,038,360	-
Peru	2,864,000 ^c	3,517,100 ^c	-	-	479,612	1,033,100
Uruguay	2,100,000 ^c	-	2,583,200	-	-	-
Venezuela	2,634,000	750,000	1,741,200	3,443,000	3,754,000	747,000
TOTAL	28,801,165	36,301,682	34,209,439	36,462,000	31,214,280	17,557,600

a January-July

Note: No information received from other Governments.

b January-October

c January-August

TABLE III

Reported cases of smallpox, by country, 1965 and 1966

Country		1965	1966
Total		3,177	3,092
Argentina	a)	15	21
Brazil		2,962	3,039
Colombia		149	b) 8
Paraguay		32	5
Peru		18	19
Uruguay	c)	1	-

a) Including one imported case

b) Confirmed cases

c) Imported case

Reported cases of smallpox, in Brazil, 1 January - 6 May 1967

State	Last Report	No. of cases	Cumulated total
Alagoas	6 May	-	-
Ceará	29 April	-	16
Espírito Santo	March	1	4
Guanabara	February	1	1
Pernambuco	January	3	3
Piauí	22 April	-	2
Rio de Janeiro	1 April	-	6
R. G. do Norte	January	-	-
R. G. do Sul	March	1	1
Sergipe (1)	February	-	-
São Paulo (1)	25 February	5	55
Total			<u>88</u>

TABLE IV
VACCINATIONS ADMINISTERED 1966

<u>Country</u>	<u>Number</u>
Argentina	1,249,904
Bolivia	1,037,883
Brasil	5,672,377
Colombia	1,626,576
Costa Rica	39,000 (Up to 30 Nov.)
Cuba	78,718
Chile	1,473,797
Ecuador	749,130
El Salvador	414,649
Guatemala	230,274
Haiti	262,854
Honduras	1,589,604
Jamaica	72,619
Mexico	2,598,890
Nicaragua	195,094
Panama	48,962
Paraguay	162,862
Peru	411,025
Dominican Republic	36,283
Trinidad and Tobago	13,869
Uruguay	213,900
Venezuela	1,081,088
Surinam	12,600

Note: No information received from other Governments.