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REPORT ON THE STATUS OF SMALLPOX ERADICATION IN THE AMERICAS

Smallpox, which is epidemiologically characteristic of urban areas or large population centers where it continues to be endemic and produces outbreaks or epidemics depending on the immunity level of the population, is one of the diseases subject to the International Sanitary Regulations.

Although man is the only depository of the smallpox virus and has had an effective and reliable prophylactic weapon ever since 14 March 1796, almost 200 years ago, when Jenner inoculated the young James Phipps, smallpox persists in an endemic-epidemic form in almost every continent, its main victims being children under 15 years of age, who account for 60% of the known cases.

To illustrate the situation that has prevailed in more recent times, mention need only be made of the fact that 765,632 cases are known to have occurred throughout the world between 1963 and 1971, 36,154 of them in the Americas. The fact that the ratio of reported to actual cases in areas where there are no well-organized epidemiological surveillance programs may be as high as 1:40 gives us some idea of the magnitude of the problem in the world.

In the Region of the Americas, 208,575 cases of smallpox are known to have occurred between 1948 and 1971 in countries in which the disease was endemic. Table 1 shows the smallpox cases reported for the period 1955-1972.

Situation in the Americas

The three countries of North America have been free of smallpox for several years. In Canada one case, imported from Brazil, was reported in 1962, and in the United States of America two imported cases were reported in 1955 and another in 1957. Mexico has been free of smallpox since 1952.

TABLE 1

Reported Cases of Smallpox in the Americas, 1955-72

Country	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972 (a)
Argentina	55	86	335	27	36	65	6	b) 2	-	b)13	b)15	21	b)23	-	-	b)24	-	-
Bolivia	372	499	1310	183	7	1	-	-	-	5	-	-	-	-	-	-	-	-
Brazil	c)2580	d)4464	d)2413	d)2190	d)3911	d)6018	8546	9583	6433	3076	3269	3518	4514	4372	7407	1771	19	-
Canada	-	-	-	-	-	-	-	e) 1	-	-	-	-	-	-	-	-	-	-
Chile	-	-	-	-	e) 1	-	-	-	-	-	-	-	-	-	-	-	-	-
Colombia	3404	2572	2145	2009	950	209	16	41	4	21	149	8	-	-	-	-	-	-
Ecuador	1831	669	913	863	1140	2185	496	204	45	42	-	-	-	-	-	-	-	-
United States	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
French Guiana	-	-	-	-	-	-	-	-	-	-	-	-	-	e) 1	-	-	-	-
Panama	-	-	-	b) 8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Paraguay	57	132	103	21	-	35	-	-	-	7	32	5	-	-	-	-	-	-
Peru	-	-	-	-	-	-	-	-	865	454	18	13	-	-	-	-	-	-
Uruguay	45	42	2	-	-	b) 19	e) 1	b)10	e) 1	e) 3	e) 1	-	-	b) 2	b) 3	-	-	-
Venezuela	2	4	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-
TOTAL	8243	8468	7222	5301	6045	8532	9065	9352	7348	3621	3484	3565	4537	4375	7410	1795	19	-

- None

a) Based on official reports received by PASB through 15 August 1973

b) Includes imported cases

c) State capitals

d) Incomplete data

e) Imported cases

Except for one case that occurred in Guatemala in 1953 and sporadic cases reported in Panama in 1947 and 1958, Belize in 1948, Trinidad and Tobago in 1948, and Martinique and the Netherlands Antilles in 1951, the other countries of Central America and the Caribbean have been free of smallpox.

In South America, Bolivia eradicated the disease in 1961, but it was reintroduced in 1964. After successful eradication campaigns, Paraguay and Peru were also reinvaded by smallpox. Chile, which had not reported any cases since 1954, reported one autochthonous case contracted from an imported case in 1959. No further cases have occurred since then. Ecuador has had no cases since 1964. After achieving eradication in 1957, Venezuela experienced an outbreak in 1962 on the frontier with Brazil as a result of imported cases, but the outbreak was quickly halted. Uruguay, which has been free of smallpox since 1957, has since that time reported only sporadic cases deriving from imported infections. In 1965, Argentina, Brazil, Colombia, Paraguay, and Peru still had endemic smallpox.

The Eradication Campaign

The Executive Committee of the Pan American Health Organization, bearing in mind the epidemiological nature of the disease in the Americas and the availability of a highly effective prophylactic procedure, approved the proposal of the Director to initiate the eradication of smallpox in the Continent at its 1949 meeting in Washington, D.C., and the proposal was later endorsed by the XIII Pan American Sanitary Conference, meeting in Santo Domingo in 1950.

Since then the Governing Bodies of both WHO and PAHO have repeatedly supported this decision by a series of resolutions. The main resolutions relevant to this problem are listed in Annex I.

In 1958 the Union of Soviet Socialist Republics proposed that the worldwide eradication of smallpox should be initiated under WHO auspices. In 1965, the United States of America carried the suggestion a step further by proposing that WHO should make a special effort to eradicate the disease during the next decade.

In 1961, the Charter of Punta del Este called upon the Governments to take immediate action to achieve the proposed goal, which was expressed in the following terms: "To eradicate malaria and smallpox from the Hemisphere and intensify the control of other common infectious diseases, such as enteric ailments and tuberculosis."

At a meeting in 1967, also held at Punta del Este, the Presidents of the Americas recommended specifically that measures for eradicating those diseases for which procedures already exist for eliminating them completely should be put into effect. This recommendation strengthened the recommendation of the Ministers of Health of the Continent, who had declared in 1963 that:

The Governments of the countries where foci still exist should intensify and accelerate their national programs of smallpox eradication, give them a high priority within national health plans, and seek such additional funds and resources as are needed from national and international sources.

The Governments that have already eradicated smallpox should establish procedures within their health services which will guarantee the maintenance of adequate levels of immunity, as well as continued vigilance to avoid possible recurrence of the disease. This can be accomplished through the annual vaccination of one fifth of the population.

The Governments should coordinate their efforts and assist each other in developing programs of smallpox vaccination aimed at eradicating smallpox in the Americas in the shortest possible time. Collaboration among countries is of special importance in border areas.

In the light of the decision taken by the Governments and the Governing Bodies of PAHO/WHO, all efforts were focussed on achieving the eradication of smallpox, and this activity came to be regarded as one of the most important of the Organization. Financial resources were allocated, and, with the authorization of the Executive Board of WHO in Resolution 12 of its 22nd Meeting, the Special Smallpox Fund was established. The Nineteenth World Health Assembly, which approved the program and budget for a worldwide smallpox eradication program in 1966, allocated a contribution to the program for the Americas to begin in 1967.

In 1966, the Pan American Health Organization prepared a questionnaire for the purpose of evaluating the smallpox situation in the countries of the Region, and the findings were submitted to the XVII Pan American Sanitary Conference. Study of this information showed what type of international assistance the countries required for the purpose of organizing, implementing, and evaluating their eradication programs.

Beginning in 1967, PAHO signed agreements and formulated operational plans with several countries, in the light of the epidemiological conditions prevailing in each, with regard to the smallpox problem.

The countries were divided into three groups, depending on the type of activity to be undertaken:

1. Attack phase - Countries with five or more cases per 100,000 inhabitants and less than 80% of the population with vaccination marks.
2. Consolidation phase - Countries with less than five cases of smallpox per 100,000 inhabitants and over 80% of the population with vaccination marks.

3. Surveillance and maintenance phase - Countries free of smallpox for over two years.

The study submitted to the XVII Pan American Sanitary Conference pointed out the difficulties which the countries of the Americas experienced in eradicating smallpox. These difficulties were divided into three categories:

(a) Budgetary difficulties - The countries did not have sufficient budgetary resources to purchase vehicles, jet injectors, laboratory equipment, and other supplies necessary for carrying out an eradication campaign. Resources in strong currency are needed for purchasing most of the requisite equipment and supplies.

(b) Lack of proper plans - This difficulty was one of the major reasons for the failure of some campaigns. Lack of continuity, which is indispensable in the maintenance programs for ensuring a satisfactory minimum level of protection of the population, was responsible for the reintroduction of smallpox in two South American countries.

The lack of supervision and evaluation, which are required in order to know the level of coverage and efficacy of the vaccine, was another common deficiency. In most of the countries, the health infrastructure was inadequate and not equipped for such important activities.

(c) Insufficient vaccine - In addition to financial problems, there were technical difficulties preventing a number of countries from producing and satisfying their requirements in respect of potent, stable, and uncontaminated freeze-dried vaccine. The donations of other countries were not sufficient to supply a program on an efficient and continuing basis.

Furthermore, the production and use of contaminated vaccines or vaccines of low potency, owing to the inadequate training of the personnel responsible for manufacturing it, and the existence of inefficient equipment, frustrated the efforts of several countries, so that it became necessary to revaccinate areas which had already been vaccinated more than once.

Activities Carried Out

1. In the light of its knowledge of the problem and of the difficulties experienced by countries in tackling it, PAHO signed agreements with the Governments of Argentina, Bolivia, Brazil, Colombia, Paraguay, Peru, Uruguay, and Venezuela and cooperated directly with the countries in formulating the relevant operational plans.

2. In order to provide advisory services for the program, PAHO sought to equip itself with a suitable technical structure and for that purpose appointed a Regional Adviser to coordinate the activities on a continental

scale, three advisers on epidemiology for Zone V (Brazil, the only country with endemic smallpox), and one each for Zones IV and VI. In addition, advisers specializing in statistics were appointed to Washington, D.C., and Zones IV, V, and VI.

Strategy and Methodology

Particular importance was given to the formulation of a strategy and methodology for the smallpox eradication program, which mainly covered the following aspects:

(a) Seminars which would not only lay down standards and procedures for work and guidance in the field but also include studies of vaccination techniques and analyses of outbreaks in order to evaluate their impact on the control of the disease.

(b) Supervision and evaluation of vaccination activities in order to determine accurately the effectiveness and results of the work done.

(c) Preparation of operational handbooks for distribution to the countries, especially to those which had signed agreements with PAHO for the eradication of smallpox. Handbooks for vaccinators, supervisors, and evaluators were specially prepared for use in Brazil.

(d) Training of personnel responsible for the activities in the various sectors of the project. With the cooperation of the CDC and the sponsorship of the Government of Brazil and PAHO, three courses were held in São Paulo, Brazil, which were attended by 18 fellows from 13 countries. Figure 1 shows the laboratories equipped for diagnosis in our Region.

(e) Advisory services to help in the reorganization and equipping of the national laboratories producing smallpox vaccine so as to enable them to reach the standards of WHO as regards vaccine potency, stability, and absence of contamination.

Production at the outset of the eradication program launched by PAHO was 17,557,600 annual doses of freeze-dried vaccine produced in the laboratories of seven countries. This vaccine was not only insufficient to meet the demand of the Region, but also failed to reach the standards of potency and stability and was often contaminated.

With the assistance of the Connaught Laboratories of the University of Toronto, Canada, technical advisory services were made available on a continuing basis and Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru, Uruguay, and Venezuela were provided with financial resources and modern equipment for manufacturing freeze-dried vaccine.

FIGURE I

LABORATORIES FOR THE DIAGNOSIS OF SMALLPOX IN THE AMERICAS



Table 2 shows the production of freeze-dried vaccine for the years 1966-1972. WHO does not recommend the use of liquid vaccine, and no information is therefore given on its production, although some countries still insist on using it in spite of the problems resulting from its application.

The present output figure for freeze-dried vaccine is now not only many times that of 1966, but the product is also of satisfactory stability and potency. The vaccine produced in eggs is also stable and potent, as is well illustrated by the results obtained in the field in Brazil.

Professionals responsible for producing freeze-dried smallpox vaccine in Argentina, Brazil, Chile, Colombia, Mexico, and Peru have visited the Connaught Laboratories in order to familiarize themselves with the techniques used there. Exchange visits were also arranged between professionals from Argentina, Brazil, Colombia, Ecuador, and Uruguay.

In addition to the strictly technical assistance given to the diagnostic and vaccine-producing laboratories and the advisory services provided for planning the strategy and methodology, the preparation of handbooks on special procedures and studies, and the distribution of publications, the cooperation of PAHO/WHO was indispensable in overcoming countless technical and administrative difficulties. Activities were undertaken for the purpose of:

1. Efficiently developing the attack phase so as to reduce incidence to levels at which more productive surveillance and containment operations are facilitated.
2. Activating the surveillance and containment services by the organization of dynamic reporting units covering the countries in their entirety.
3. Ensuring that priorities are established in vaccination programs with regard to the immunization of children under 15 years of age, that greater epidemiological importance is given, in order to achieve eradication, to primovaccination than to revaccination, and that all newborn children are vaccinated.
4. Making the vaccination of health personnel compulsory, particularly of those working in hospitals, and making vaccination of patients in hospitals a routine procedure.
5. Developing the practice of maintenance vaccination in local health services.
6. Setting up a freeze-dried vaccine bank in the headquarters of Zone V to deal with emergency requests from any country of the Continent, and maintaining stocks of vaccine produced in eggs to deal with emergencies in the countries of Middle America which are free of foot-and-mouth disease.

TABLE 2

Production of Freeze-dried Vaccine in the Americas,1966-1972

Country	Y e a r						
	1966	1967	1968	1969	1970	1971	1972
Argentina	-	560,000	14,944,800	21,427,850	44,350,325	12,218,600	18,156,500
Bolivia	1,800,000	400,000	-	230,000	235,250	-	-
Brazil	9,386,200	31,331,900	49,482,650	61,000,000	72,298,050	44,726,975	29,386,650
Chile	36,500	693,000	1,962,000	3,950,000	721,000	500,000	483,500
Colombia	2,535,000	4,504,502	7,992,200	7,586,500	10,800,000	4,000,000	4,300,000
Ecuador	2,019,800	1,559,740	-	-	1,800,000	2,400,000	1,200,200
Guatemala	-	-	263,300	-	-	-	-
Peru	1,033,100	2,220,000	5,848,750	6,527,200	6,227,800	5,227,950	4,670,000
Venezuela	747,000	624,000	-	-	-	-	301,025
TOTAL	17,557,600	41,893,142	80,493,700	100,721,550	136,432,425	69,073,525	58,497,875

As shown in Table 3, indigenous cases of smallpox in 1967 occurred only in Argentina and Brazil, although some of those reported in Argentina were imported.

Colombia, Paraguay, and Peru reported their last cases in 1966 and began the maintenance phase in 1969.

The cases occurring in French Guiana and Uruguay in 1968 and 1969 were imported.

Argentina, which had reported no cases in 1968 and 1969, had an outbreak of 23 indigenous cases in 1970 deriving from an imported case in the Province of Misiones.

Brazil, which is actually responsible for the spread of the disease to neighboring countries, had a much smaller number of cases in 1970 than in 1969, even though surveillance and detection had been greatly intensified. In 1971 the drop is even more striking because, up to 30 June, only 19 cases of smallpox were reported for the country as a whole, all of them occurring in the city of Rio de Janeiro, whereas 1,211 cases were reported during the same period of 1970.

Because of the need to check the success of the activities which led to the interruption of transmission and epidemiological silence in almost all the South American countries, an investigation was carried out of the so-called "problem areas," i.e., those in which the last reports had been registered and where some residual unregistered cases probably existed. In the countries of South America these areas are precisely the ones in which surveillance and maintenance activities are less effective or nonexistent.

The investigation comprised the areas in South America where smallpox had been present until recently, either in its indigenous form or as a result of imported cases.

A compilation was made of the data, information, and inquiries to be taken into account by the surveyors assigned to each zone and included the following main points:

- Map of the area specifying the localities to be visited
- Estimated population in the area under study
- Reporting on localities to be investigated

The following were interviewed in each locality:

- Local authorities (intendant, prefect, mayor, etc.)

TABLE 3

Reported Cases of Smallpox in the Americas, 1966-1972

Country or other Political Unit	1966	1967	1968	1969	1970	1971	1972 (a)	TOTAL
Argentina	21	(b) 23	-	-	(b) 24	-	-	(b) 68
Brazil	3,518	4,514	4,372	7,407	1,771	19	-	21,582
Colombia	8	-	-	-	-	-	-	8
French Guiana	-	-	(c) 1	-	-	-	-	(c) 1
Paraguay	5	-	-	-	-	-	-	5
Peru	13	-	-	-	-	-	-	13
Uruguay	-	-	(b) 2	(b) 3	-	-	-	(b) 5
TOTAL	3,565	4,537	4,375	7,410	1,795	19	-	21,682

a) Based on official reports received by PASB through 15 August 1973.

b) Includes imported cases.

c) Imported.

- Health services (health centers, public and private hospitals, dispensaries, malaria posts, etc.). All services were visited
- All schools and colleges. Photographs of smallpox cases were shown and questions such as the following asked:

Has there been any smallpox in the last 12 months? Yes No

Where?

When?

The director of the staff or teaching body was questioned.

At least five classes were questioned; if the school operates on a shift system, the pupils of the shift at work at the time of visit were questioned.

The Director of the Pan American Sanitary Bureau has also contacted the Ministers of Health of the Americas, informing them of the success of the smallpox program and requesting their support and a further effort to consolidate eradication once and for all.

The Director's message considered the following essential points:

1. That local health bodies were instructed to be alert and to take necessary action to identify suspicious cases of smallpox, including laboratory examinations, and to investigate the chain of transmission of the disease.
2. That the cooperation of the malaria eradication program personnel was enlisted to help implement point 1.
3. That special inquiries be made in those areas of the country in which the latest smallpox cases were reported or surveillance is less effective.

Besides, the Director offered all the necessary collaboration of PAHO/WHO for the proposed investigations.

Special studies conducted in 1971 and 1972 in the countries bordering Brazil, and in greater depth and detail in Brazil itself, showed that not a single case of smallpox had been confirmed in all of South America.

Surveys by special PAHO/WHO consultants in the countries and territories of Zone I of South America - Venezuela, Guyana, Surinam, and French Guiana - showed smallpox to be absent in that Zone. The vaccination maintenance program was inadequate in all the countries but Venezuela.

In Venezuela, where smallpox was eradicated in 1947, there was an outbreak of nine cases in 1962 in the locality of Santa Elena on the Brazilian border. The disease was imported from Brazil. A sampling of the population for vaccination scars in 1971 revealed a general protection level of 91.6% of the population, while the level for Santa Elena was 82%

Periodic studies in Zone IV - Bolivia, Colombia, Ecuador, and Peru - confirm the epidemiological silence in the records of the last several years. Special investigations were conducted in all Zone IV countries in 1971 and 1972 to confirm the absence of smallpox cases.

Thus, surveys were made in jungle areas of the Amazon basin and of the comisaría (province) of Vaupés and in the Upper Guajira in Colombia; in the Ecuadorian localities of General Morales and Suscal, where the most recent cases of smallpox occurred; along the Amazon River from Petrópolis to Iquitos in Peru; and in the Bolivian province of Larecaja.

All these investigations gave negative results for smallpox.

Table 4 shows the levels of protection against smallpox in the countries of Zone IV.

The network of reporting units was progressively expanded, as indicated by Tables 5, 6, and 7, which refer to the years 1971, 1972, and 1973.

The number of epidemiological investigations of suspected cases in the 1971-1973 period, by units of the Federation, including laboratory examinations, is given in Table 8.

Another special epidemiological investigation was conducted in 451 localities of Brazil's federal units from July 7 to November 21, 1972.

The 317,292 persons interviewed included 1,309 political officials, 2,534 health officials, 15,579 health service employees, 5,278 persons in the private medical service, 561 workers in civil records offices, 45,605 businessmen and manufacturers, 125,000 schoolteachers and pupils, and 120,405 members of the general public.

The investigation turned up 96 suspected cases of smallpox, none of them confirmed. Table 9 presents the final diagnoses of these cases, including those which were confirmed by laboratory tests.

There are at present 21 epidemiological surveillance units (UVE's), covering 22 states, the Federal District (Brasília), and four territories, with auxiliary sub-units where necessary.

The present number of reporting stations (PN's) is 6,362. They are distributed among 3,542 of the country's 3,951 municipios (counties). See Table 10.

TABLE 4

Evaluation by Sampling of the Protection Levels, by Age Groups,
in the Countries of Zone IV, 1972 and 1973⁽¹⁾

COUNTRY	Under 5 years of age			5-14 years of age			15 years and over		
	Present	Positive	%	Present	Positive	%	Present	Positive	%
Colombia	-	-	-	-	-	-	-	-	-
Ecuador (2)	2,420	998	41.2	3,844	3,282	85.3	2,094	1,853	88.4
Peru	5,615	5,051	90.0	6,835	6,587	96.4	12,883	11,465	89.0
Bolivia	1,106	797	72.1	1,708	1,625	95.2	1,823	1,793	98.3
TOTAL	9,141	6,846	74.9	12,387	11,494	96.4	16,800	15,111	89.9

(-) No evaluation

(1) January-June

(2) In 1972

TABLE 5
Epidemiological Surveillance Units, Number of Reporting
Stations and Average Number of Those Reporting
Regularly During 1971 - Brazil

Surveillance Units by Major Political Division (a)	Number of Municipios	No. of Stations	No. of Muni- cipios with Stations	% Coverage	Stations Punctual (avge)	% *
BRAZIL, Total	3,953	3,243	2,904	73.5	680	
<u>NORTH</u>						
Rondônia	2	1	1	50.0	1	...
Acre	7	1	1	14.3	1	...
Amazonas	44	1	1	2.3	1	...
Roraima	2	1	1	50.0	1	...
Pará	83	1	1	1.2	1	...
Amapá	5	1	1	20.0	1	...
<u>NORTHEAST</u>						
Maranhão	129	142	122	94.6	67	47
Piauí	114	140	114	100.0	66	47
Ceará	142	150	118	83.1	46	31
Rio Grande do Norte	150	130	101	67.3	33	25
Paraíba	171	100	83	48.5	40	40
Pernambuco	164	135	108	65.2	61	45
Alagoas	94	96	94	100.0	53	55
Fernando de Noronha	1	1	1	100.0	1	100
Sergipe	76	80	76	100.0	70	88
Bahia	336	214	180	55.4	86	40
<u>SOUTHEAST</u>						
Minas Gerais	722	288	283	35.9	147	51
Espírito Santo	53	83	53	100.0	77	93
Rio de Janeiro	63	71	63	100.0	22	31
Guanabara	1	23	1	100.0	23	100
São Paulo	571	584	571	100.0	489	84
<u>SOUTH</u>						
Paraná	288	318	287	98.6	267	84
Santa Catarina	197	188	173	76.6	148	79
Rio Grande do Sul	232	227	219	93.5	211	93
<u>CENTRAL-WEST</u>						
Mato Grosso	84	34	25	40.4	34	100
Goiás	221	222	216	97.7	82	37
Distrito Federal	1	11	1	100.0	11	100

(a) In the Federal District and each state or territory there is an ESU installed in the capital (in the Department of Health), as well as a network of RS's; the latter are located in the Municipal Seat, at least of each municipio which has one.

* Weekly average.

TABLE 6

Status of the Reporting System of the Epidemiological
Surveillance Units According to the Number of Reporting
Stations Installed in Municipios, by Major Political

Divisions, Brazil - 1972

Major Political Divisions	Total Municipios	RS's Installed		Municipios with RS's	% Coverage	% Punctual
		Total	Capital			
BRAZIL, Total	3,951	6,074	365	3,513	88.9	53.0
Rondônia	2	25	1	2	100.0	...
Acre	7	8	1	7	100.0	...
Amazonas	44	36	12	24	54.5	33.3
Roraima	2	10	2	2	100.0	28.0
Pará	83	76	10	59	71.1	...
Amapá	5	10	6	5	100.0	...
Maranhão	129	149	22	129	100.0	40.8
Piauí	114	121	28	93	81.6	79.6
Ceará	142	161	31	130	91.5	...
Rio Grande do Norte	150	180	17	150	100.0	16.3
Paraíba	171	159	9	153	89.5	100.0
Pernambuco	164	194	28	163	99.4	36.1
Alagoas	94	96	3	94	100.0	9.4
Fernando de Noronha	1	1	1	1	100.0	100.0
Sergipe	74	80	7	74	100.0	81.2
Bahia	336	271	22	249	73.2	24.2
Minas Gerais	722	495	6	490	65.4	34.0
Espírito Santo	53	84	8	53	100.0	100.0
Rio de Janeiro	63	86	24	63	100.0	67.4
Guanabara	1	35	35	1	100.0	100.0
São Paulo	571	2,710	13	571	100.0	90.4
Paraná	288	317	32	281	97.6	77.7
Santa Catarina	197	204	8	197	100.0	77.8
Rio Grande do Sul	232	236	14	221	96.1	82.3
Mato Grosso	84	93	12	79	89.3	62.5
Goiás	221	* 227	7	221	100.0	7.5
Distrito Federal	1	11	6	1	100.0	100.0

Data refer to November.

*Including 71 RS's under the jurisdiction of the Federal District region of SUCAM. The criterion used to measure coverage is based on the hypothesis that a municipio is 100% covered if there is at least one RS in it, which in reality does not always mean real functional coverage.

TABLE 7

Status of the Reporting System of the
Epidemiological Surveillance Units According to the
Number of RS's Installed in Municípios, by Major
Political Divisions of Brazil, during the First
Six Months of 1973

Major Political Divisions	Total Municípios	RS's Installed		Municípios with RS's	% Coverage	% Punctual	Susp. Cases Invest.
		Total	Capital				
BRAZIL, total	3,951	6,381	365	3,554	90.0	56.9	15
Rondônia	2	25	1	2	100.0	...	-
Acre	7	8	1	7	100.0	...	-
Amazonas	44	42	12	30	68.2	28.6	-
Roraima	2	10	2	2	100.0	...	-
Pará	83	82	10	65	79.3	* 53.0	-
Amapá	5	10	6	5	100.0	...	-
Maranhão	129	151	22	129	100.0	34.3	-
Piauí	114	121	28	93	81.6	29.5	-
Ceará	142	161	31	130	91.5	15.4	-
Rio Grande do Norte	150	180	17	150	100.0	26.1	-
Paraíba	171	159	9	153	89.5	100.0	-
Pernambuco	164	195	28	164	100.0	46.7	* 1
Alagoas	94	96	3	94	100.0	35.6	1
Fernando de Noronha	1	1	1	1	100.0	100.0	-
Sergipe	74	80	7	74	100.0	71.9	-
Bahia	336	271	22	249	74.1	17.3	2
Minas Gerais	722	511	6	506	69.8	37.4	1
Espírito Santo	53	87	8	53	100.0	94.2	1
Rio de Janeiro	63	91	24	63	100.0	62.9	-
Guanabara	1	36	36	1	100.0	100.0	5
São Paulo	571	2,962	12	571	100.0	83.7	-
Paraná	288	317	32	281	97.6	* 54.4	-
Santa Catarina	197	204	8	197	100.0	81.5	-
Rio Grande do Sul	232	245	14	230	97.4	89.3	4
Mato Grosso	84	96	12	82	97.6	54.1	-
Goias	221	227	7	221	100.0	100.0	-
Distrito Federal	1	13	6	1	100.0	100.0	-

* Information for the month of April.

The suspected cases investigated are those reported monthly by the respective Epidemiological Surveillance Units.

TABLE 8

Notifications, Investigations and Final Diagnoses
of Cases by Regions and Major Political Divisions
of Brazil, 1971-1973*

Major Political Divisions	1 9 7 1			1 9 7 2			1 9 7 3*		
	Notif. Susp. Cases	Investi-gations	Lab. Tests	Notif. Susp. Cases	Investi-gations	Lab. Tests	Notif. Susp. Cases	Investi-gations	Lab. Tests
BRAZIL, Total	450	444	320	718	718	375	131	131	97
<u>NORTH</u>									
Rondônia	-	-	-	-	-	-	-	-	-
Acre	-	-	-	-	-	-	-	-	-
Amazonas	-	-	-	4	4	4	-	-	-
Roraima	-	-	-	-	-	-	-	-	1
Pará	-	-	-	5	5	5	-	-	-
Amapá	-	-	-	-	-	-	-	-	-
<u>NORTHEAST</u>									
Maranhão	10	10	4	8	8	5	-	-	-
Piauí	2	2	2	30	30	7	5	5	-
Ceará	20	20	15	5	5	4	7	7	6
R.G. do Norte	-	-	-	-	-	1	3	3	-
Paraíba	1	1	-	5	5	3	-	-	-
Pernambuco	18	18	9	76	76	34	16	16	12
Alagoas	-	-	-	3	3	4	2	2	1
Fernando de Noronha	-	-	-	-	-	-	-	-	-
Sergipe	5	5	5	11	11	2	6	6	2
Bahia	22	16	18	59	59	26	11	11	8
<u>SOUTHEAST</u>									
Minas Gerais	32	32	24	39	39	50	14	14	10
Espírito Santo	31	31	27	19	19	33	4	4	4
Rio de Janeiro	26	26	18	48	48	26	9	9	4
Guanabara	35&	35&	25&	181	181	29	9	9	-
São Paulo	118	118	80	124	124	64	16	16	18
<u>SOUTH</u>									
Paraná	42	42	35	37	37	38	1	1	2
Sta. Catarina	9	9	6	13	13	7	11	11	8
R.G. do Sul	63	63	40	40	40	24	15	15	18
<u>CENTRAL-WEST</u>									
Mato Grosso	-	-	-	7	7	3	2	2	3
Goiás	11	11	10	4	4	6	-	-	-
D. Federal	5	5	2	-	-	-	-	-	-

* Provisional data to 30 June.

& Including 19 confirmed cases of smallpox.

TABLE 9

Number and Category of Persons Interviewed
in the Survey Conducted in the Areas at Greatest Risk in Brazil
in 1972

Category or Locality	Persons Interviewed	Suspected Cases Notified
Political officials	1,309	1
Health officials	2,535	3
Health services	15,579	2
Private medical services	5,378	1
Public records offices	561	6
Factories or business enterprises	45,605	1
Schools:	125,920	19
Teachers * 1,104		...
Students * 26,209		...
Other sources	120,405	63
Totals	317,292	96

* Included in the total for schools.

TABLE 10

Status of the Network of Stations for Epidemiological Reporting
of Smallpox According to the Number of Stations Installed and
Indices of Coverage and Promptness, by Major Political Divisions
of Brazil, 1973

Major Political Divisions	Date of the Information	Total Munic.	RS's Installed		Munic. w/RS's	% Cov.	% Punct.	Cases Invest	Telegr. Reports *
			Total	Capital					
Brazil, Total		3,951	6,362	365	3,542	89.6	70.1	25	
<u>North</u>									
Rondônia	14-04-73	2	25	1	2	100.0	...		
Acre	...	7	8	1	7	100.0	...		
Amazonas	21-04	44	42	12	30	68,2	28.6		
Roraima	20-01	2	10	2	2	100.0	33.3		18
Pará	28-04	83	76	10	59	71.1	...		18
Amapá	24-03	5	10	6	5	100.0	...		
<u>Northeast</u>									
Maranhão	21-04	129	151	22	129	100.0	29.6		
Piauí	14-04	114	121	28	93	81.6	40.7	3	17
Ceará	14-04	142	161	31	130	91.5	19.1		17
Rio Grande do N.	21-04	150	180	17	150	100.0	18.9		17
Paraíba	28-04	171	159	9	153	89.5	87.9		18
Pernambuco	7-04	164	194	28	163	99.4	44.9	10	18
Alagoas	21-04	94	96	3	94	100.0	12.0		18
Ferndo. Noronha	28-04	1	1	1	1	100.0	100.0		18
Sergipe	24-04	74	80	7	74	100.0	76.3	1	18
Bahia	14-04	336	271	22	249	74.1	21.4	2	18
<u>Southeast</u>									
Minas Gerais	28-04	722	511	6	506	70.1	41.5		
Espírito Santo	28-02	53	87	8	53	100.0	94.3	**4	
Rio de Janeiro	28-04	63	91	24	63	100.0	58.8		
Guanabara	28-04	1	36	36	1	100.0	100.0	2	
São Paulo	31-03	571	2,955	12	571	100.0	88.0		18
<u>South</u>									
Paraná	7-04	288	317	32	281	97.6	88.6		
Santa Catarina	21-04	197	204	8	197	100.0	87.5		18
Rio Grande do S.	21-04	232	241	14	226	97.4	89.4	3	18
<u>Central-West</u>									
Mato Grosso	28-04	84	96	12	81	96.4	52.1		
Goiás	21-04	221	227	7	221	100.0	9.1		
Dto. Federal	28-04	1	12	6	1	100.0	100.0		18

*The number indicates the reporting week of the year (week No. 18 = 4 May 1973).

The column "Cases Investigated" refers to cases reported in the monthly report of activities of the ESU for the month of March.

**Data for February.

Source: Data available in the Central Office of Headquarters, National Department of Prevention and Control of Diseases, Ministry of Health, Rio de Janeiro, Guanabara.

The effort of the Brazilian Government to interrupt the transmission of smallpox deserves special mention. To make possible the vaccination of a population estimated in 1967 at 90,000,000, living in an area of 8,500,000 km², the Government has been spending an average of \$1,200,000 annually on the eradication campaign. With an eye to the negative results of an identical campaign conducted earlier in Asia, many were skeptical that Brazil could achieve the gratifying results now visible.

It is worth emphasizing the ability and dedication of those responsible for the Smallpox Eradication Campaign in Brazil. A Herculean effort is represented by the careful preparation of work manuals; the rigorous logistical planning; the vaccinating, search for cases, and supervision of activities in the field; the assessment of the coverage achieved by the vaccinators in each area; and the detection of immunity postvaccination.

It was teamwork, with directors, technicians in various specialties, and auxiliary personnel of the federal, state, and county governments working together toward a single goal - the eradication of smallpox in Brazil. It was not the effort of a single person or a single official at any given time, nor would it be right to view it as such. Everyone made his contribution, and the Pan American Health Organization and the World Health Organization are proud to have assisted with their technicians and resources in the pursuit of this goal, which was achieved as of 19 April, 1971.

Special investigations were made in the countries of Zone VI - Argentina, Chile, Paraguay, and Uruguay - as well. The only exception is Chile, which has not had a case since 1959, when one was imported.

In 1970, an outbreak of 24 cases in Misiones Province, Argentina, resulting from an imported case, interrupted the freedom from the disease which Argentina had enjoyed since 1966. A massive vaccination campaign, reaching 84.18% of the population of 443,020, followed the outbreak. Since the chronological program of vertical vaccination was not being carried out in a normal manner, a special consultant was sent to Argentina in 1971 to assess the country's epidemiological situation with respect to smallpox. Together with an Argentine technician, he visited 14 localities and interviewed 86 persons, including school and health service personnel in the cities of Buenos Aires, Corrientes, Posadas, and Santa Fé. The survey led to examination of 16 cases of chicken pox, but no cases of smallpox were confirmed in the country.

Epidemiological surveillance is conducted by qualified personnel of the Secretaría de Salud Pública (Secretariat of Public Health), who visit reported cases with a view to confirming or rectifying the reports.

In Chile, thanks to vaccination programs adequately maintained by the regular health services, there have been no cases of smallpox in 20 years, other than the one confirmed in 1959. An average of 1,300,000 persons were vaccinated annually in the health areas between 1964 and 1970.

The last five confirmed cases in Paraguay occurred in 1966.

In 1971 a special survey was conducted by PAHO/WHO technicians and national personnel in the areas considered of highest risk. Traveling some 5,000 km. through the country, they covered 88 localities in six health regions. They interviewed 39 physicians, 37 midwives, 4 health educators, 13 health inspectors, 13 statisticians, 19 nurses, 63 primary- and secondary-school principals, 371 primary- and secondary-school teachers, 19 civilian officials, and 68 schools with 9,253 pupils.

As a result of 15 reports of suspected cases, 50 people were examined. No smallpox was found. Another investigation was conducted in randomly chosen schools and health posts around the country.

Replies were received from 102 health units and 206 schools with 35,898 pupils. All were negative in regard to suspected cases of smallpox.

Booster vaccinations and epidemiological surveillance are provided by the health regions and their regular health services.

The sporadic cases which have occurred in Uruguay since 1963 have been imported from Brazil.

Though a lyophilizer has been supplied by PAHO/WHO, the Uruguayan vaccination program continues to use liquid vaccine. However, the absence of native cases indicates that the protection conferred is satisfactory.

A sampling in nine departments revealed scars in 75.7% of the 3,208 persons examined, ranging from 55.5% in Artigas Department to 92.3% in Treinta y Tres Department.

The epidemiological surveillance program is considered satisfactory. In the interest of speed in diagnosis and other needed measures, suspected cases are reported by telephone.

The above review of activities since the start of the program in 1967, with the collaboration of PAHO/WHO, shows that eradication efforts based on vertical vaccination programs or on use of the regular health services, supplemented by epidemiological surveillance activities, have achieved their objective, justifying the effort and money expended.

The need now is to maintain what has been accomplished. A well organized system of epidemiological surveillance, with its staff on a permanent state of alert, is necessary. High quality data must be produced, and any report of a suspected case must be followed immediately by laboratory tests and any further action that may be indicated.

Neglect of smallpox surveillance, permitting the reintroduction of the disease in this Region, would be inadmissible, especially when we know

that shortcomings in our countries' health infrastructures leave booster vaccination activities in a precarious state.

Surveillance must be well organized, strongly motivated, and active, and must rely on personnel that is well prepared technically and psychologically. Its efficiency necessarily depends on uniformity of action, organization, and resources, and on unified coordination within a framework of well-defined lines of authority. Only thus will it be possible to receive information and take indicated action promptly enough for it to be efficient.

Well-organized epidemiological surveillance of smallpox will then serve as the infrastructure for the control of other communicable diseases, particularly those for which vaccinations exist, such as polio, measles, diphtheria, tetanus, and whooping cough. Nor must we forget cholera, for which we must be prepared well in advance should it appear. If integration is the key word in the field of public health in general, how much more strongly must it be heeded in regard to communicable diseases, and particularly in matters of epidemiological surveillance.

In conjunction with their epidemiological surveillance activities, it is important that the countries, especially those having the most direct interchanges with infected areas on other continents, tend duly to booster vaccination activities so as to assure a satisfactory level of protection. The importance of this protection is most apparent when we recall that the prevalent form in some endemic areas is variola major, known for its high lethality. The risks, should it be introduced in an unprotected population, require no further comment. Table 11 shows the vaccination records for the countries of the Americas between 1967 and 1972.

Annex III to this document is the report, including conclusions and recommendations, of the special PAHO/WHO commission appointed to assess the smallpox eradication program in South America. The commission met in August 1973 in Brazil.

The commission examined the documents submitted to it, heard several supplementary reports, and discussed the implementation and results of the programs. In addition, the commission members visited surveillance units in various states of Brazil, took part in a field study, and had a chance to observe and evaluate the country's surveillance system.

As a result of these activities, the commission confirmed that smallpox has been absent from our Continent since 19 April 1971, when the last case of smallpox in Brazil and the Americas was reported and confirmed.

TABLE 11

Vaccinations Against Smallpox in the Americas, 1967-1972

Country	1967	1968	1969	1970	1971	1972 (a)
<u>Countries with eradication agreements</u>						
Argentina	2,441,629	323,952	2,141,000	11,008,800	1,544,943	950,000
Bolivia	(a) 1,141,991	319,688	442,213	460,096	638,576	211,313
Brazil	17,983,660	21,405,830	25,850,711	37,325,209	18,010,098	13,882,924
Chile	1,556,506	1,520,315	1,304,379	1,150,194		675,616
Colombia	2,307,324	5,236,389	5,543,507	4,520,971	1,243,210	986,553
Cuba	113,489	90,745	114,995	119,507	101,302	17,964
Ecuador	508,247	1,113,741	931,492	945,831	755,649	353,209
Paraguay	167,358	183,098	214,053	337,764	328,761	316,326
Peru	2,222,055	1,676,853	2,195,052	2,630,726	2,118,210	2,419,276
Uruguay	299,269	502,937	442,531	545,696	361,279	166,171
Venezuela	1,502,099	1,592,740	1,378,671	1,119,235	869,078	939,944
<u>Other countries and areas</u>						
Antigua	...	...	...	618	...	...
Neth. Antilles	3,000	...	...	...	...	...
Bahamas	4,141	2,273	2,530	3,029	4,076	...
Barbados	10,865	10,626	9,514	17,000	...	...
Belize	5,951	7,390	8,609	...	8,827	...
Bermuda	2,589	2,797	...	...	3,128	...
Canada	...	...	(a)1,726,652	...	883,214	...
Costa Rica	673,364	14,589	23,929	83,925	33,953	30,797
Dominica	2,412	2,490	3,797	3,177	...	...
El Salvador	269,207	78,932	248,957	285,143	283,028	...

TABLE 11 (cont.)

Country	1967	1968	1969	1970	1971	1972
Guadeloupe	5,457	...	...	...	18,039	...
Guatemala	437,576	121,295	...	...	...	140,822
Guyana	5,398	11,823	16,558	536,028	12,126	...
French Guiana	...	...	...	5,181	10,444	...
Haiti	338,024	446,506	229,434	...	...	...
Honduras	186,105	156,869	43,172	52,362	145,716	...
Falkland Is.	...	155	...	...	...	...
Brit. Virgin Is.	278	264	...	338	...	...
Jamaica	92,587	39,004	...	...	...	...
Martinique	7,084	8,536	...	...	5,691	...
Mexico	3,244,116	3,674,081	2,423,472	2,531,062	3,160,369	...
Nicaragua	93,503	52,233	82,488	...	...	...
Panama	42,153	44,935	7,610	70,813	...	29,410
Puerto Rico	56,140	333,296	83,937	83,317	64,507	...
Dominican Republic	108,642	8,716	8,728	14,789	11,698	...
St. Kitts-Nevis Anguilla	7,378	...	3,136	2,421	3,323	...
St. Lucia	...	96	...	...	...	...
St. Vincent	...	...	1,215	908	...	...
Surinam	...	...	...	...	12,676	...
Canal Zone	9,705	9,452	8,081	8,332	8,279	...

(a) Provisional

... Data not available

THE MAJOR PAHO/WHO RESOLUTIONS ON SMALLPOX

PAHO

- May 1949 - The Executive Committee, meeting in Washington, D.C., adopts the Director's proposal to eradicate smallpox.
- October 1950 - The XIII Pan American Sanitary Conference, meeting in Santo Domingo, Dominican Republic, endorses that proposal.
- October 1954 - The XIV Pan American Sanitary Conference, meeting in Santiago, Chile, authorizes the Director to spend \$144,089 on the smallpox program.
- October 1965 - The XVI Meeting of the Directing Council declares smallpox eradication to be a fundamental objective of the Pan American Health Organization.
- October 1966 - The XVII Pan American Sanitary Conference authorizes the Director to furnish the countries with the material aid necessary to eradicate smallpox on the continent.

WHO

Resolutions of the 3rd, 6th, 8th, 11th, 12th, 13th, 14th, 15th, 16th, 18th, and 19th World Health Assemblies repeatedly dealt with the problem of eradicating smallpox.

Resolution 12 of the 22nd Meeting of the Executive Board authorized creation of a Special Smallpox Fund.

In May 1966 the 19th World Health Assembly, in Resolution 16, allocated WHO funds for the smallpox program. From 1967 to 1972, the sums allocated have been:

1967	\$ 39,789
1968	842,000
1969	671,000
1970	682,000
1971	682,000
1972	494,421

Total \$ 3,411,210

PUBLICATIONS

1. Manual for Eradication Programs
2. Manual for Surveillance, Control, and Maintenance
3. Standards of Laboratory Diagnosis
4. Standards for Production of Lyophilized Vaccine
5. Studies and Conclusions of the Scientific Group
6. Study on Forked Needle
7. Epidemiological Surveillance Bulletin (Brazil)
8. Standards for Production of Biologicals
9. Committee of Smallpox Experts
10. Distribution of slides on smallpox cases
11. Pictorial guide for diagnosis of smallpox cases

CD22/19 (Eng.)
ANNEX III

FINAL REPORT OF THE SPECIAL COMMISSION FOR THE ASSESSMENT
OF THE SMALLPOX ERADICATION PROGRAM IN THE AMERICAS



PAN AMERICAN HEALTH ORGANIZATION

ASSESSMENT OF THE SMALLPOX ERADICATION PROGRAM IN SOUTH AMERICA

WORLD HEALTH ORGANIZATION

RIO DE JANEIRO / BRASILIA, BRAZIL, 14-25 AUGUST 1973

The PAHO/WHO Commission for the Assessment of the Smallpox Eradication Program in South America met for the first time in the city of Rio de Janeiro, on August 15, 1973; it was made up by the following members:

Dr. Alfredo N. Bica	Brazil
Dr. Robert Wilson	Canada
Dr. J. Donald Millar	United States of America
Dr. Francisco Cambournac	Portugal
Dr. Eriberto Echezurfa	Venezuela

Dr. Alfredo N. Bica of Brazil was elected Chairman, Dr. Robert Wilson of Canada, Vice Chairman, and Dr. Eriberto Echezurfa of Venezuela, Rapporteur.

Representing the host country, Drs. Eurico Suzart de Carvalho Filho, Alyrio Macedo Filho, Arlindo Lavigne de Lemos and João Baptista Risi took part in the discussions.

The Secretariat was constituted by Dr. Bichat A. Rodrigues, Chief, Department of Communicable Diseases, PAHO/WHO; Dr. E. Shafa, Smallpox Eradication Unit, WHO, Geneva; Dr. Conrado Ristori C., Epidemiologist, Zone VI, PAHO/WHO; Dr. Mario Miranda and Dr. Edilberto Antezana, Epidemiologists, Zone V, PAHO/WHO; Dr. Italo Barragán, Epidemiologist, Ecuador, PAHO/WHO; Mr. Alberto Uribe, Technical Officer, Zone IV, PAHO/WHO; and Mr. Federico Varela, Statistician, Zone V, PAHO/WHO.

The Commission held six sessions at the Instituto Castello Branco of Rio de Janeiro, during which it examined and discussed the reports of each of the countries which, through agreements with PAHO/WHO, conducted smallpox eradication programs. These programs were presented by members of the technical groups that executed or collaborated in the respective activities.

The members of the Commission had a chance to visit several states of Brazil and participate in the epidemiological investigation of suspected cases reported and to observe the operation of the existing epidemiological surveillance system.

At one of the sessions, a presentation was made on the operation of one of the diagnostic laboratories of the country by Dr. Hermann Schatzmayr of the Instituto Oswaldo Cruz of Rio de Janeiro.

A presentation on the activities of epidemiological surveillance and maintenance was made to the Commission by Dr. Ruy Soares, from the Secretariat of Health of the State of São Paulo. This report was not included in the original report. Considering the level of coverage and also systematic investigation of every suspected case with laboratory support, the Commission considered that epidemiological surveillance for smallpox was satisfactory in the State of São Paulo.

The Commission had its final meetings in Brasília, where the conclusions and recommendations were prepared, and presented to the Minister of Health of Brazil, Dr. Mário Machado de Lemos during a special meeting with the Commission members.

* * * * *

The Special Commission for the Assessment of the Smallpox Eradication Program in South America analyzed and discussed in detail the information and documentation presented in relation to countries which carried out eradication programs based on agreements signed with PAHO/WHO.

As a result of that study, the Commission arrived at the following conclusions:

1. COVERAGE

- a. It was observed that coverage for the attack phase provided for in the operation plans was, in general, achieved.
- b. Brazil, the most important country from the eradication standpoint for her widespread land area, large population, and for the high number of cases known each year, and for constituting the only foci for the spread of the disease, was outstanding for the vaccination coverage attained, some 84% of the estimated population - about 90 million people.
- c. The attack phase was implemented through vertical campaigns, with the exceptions of a few countries in which these activities were carried out by the regular health services.
- d. The countries are undertaking maintenance programs: nevertheless, it was observed that protection levels are generally insufficient in children under five years and in areas of difficult access.

- e. The importance of the reporting of suspected cases, and vaccination of the population in border areas were emphasized.
- f. It is necessary to break down vaccination data in primary vaccinees and revaccinees.
- g. Emphasis was given to the need for countries having direct interchange with smallpox areas in other continents to maintain a constantly high protection level in order to avoid possible reintroduction of the disease and subsequent dissemination in the Americas.

2. EPIDEMIOLOGICAL SURVEILLANCE

- a. The value given by the countries of the Region to epidemiological surveillance, within the activities of their health services, was discussed; there is, nevertheless, the need for improving the existing reporting system in certain areas of some countries.
- b. Emphasis was placed upon the importance of the work done by international agencies, in coordination with the countries, in organizing and strengthening the epidemiological systems, with the participation of their epidemiologists.
- c. It was concluded that the epidemiological surveillance system maintained by Brazil at the present time is satisfactory, taking into consideration the existence of one epidemiological surveillance unit in each state of the country, with extension to the territories, supported by a widespread network of reporting posts, covering 90% of the municipalities of the country.
- d. Recognition is given to the need for having regular and timely information on all suspected cases.
- e. The need for epidemiological surveillance services having adequately trained medical epidemiologists was stressed.
- f. In the notification of cases in the rural areas, emphasis was given to the importance of using lay personnel for the reporting of cases; they should be afforded the necessary facilities to carry out their duties.
- g. Since the occurrence of the last case of smallpox in South America, in April 1971, the confirmation diagnosis of each suspected case bears fundamental importance. For this reason, laboratory examination of all samples constitutes a very important support in epidemiological surveillance.

- h. The majority of countries maintain efficient services for laboratory diagnosis of smallpox. Nevertheless, attention is called to the existence of deficiencies in the collection, packaging and shipment of specimens, which impairs, in some cases, the diagnostic techniques.

There is no interchange of information among laboratories, even within the same country, nor are the services of the PAHO/WHO reference laboratories utilized.

3. VACCINE

- a. Freeze-dried vaccines produced by the countries of the Region, according to tests made by the reference laboratories, proved in general to be of good quality. Present production is sufficient to cover the needs of the Region and also to collaborate, through WHO, with the eradication programs of other areas of the world.
- b. Some countries continue to produce liquid vaccine for total or partial use in their respective jurisdictions.
- c. Most of the countries do not regularly send vaccine specimens to the reference laboratories.

The Commission concludes that smallpox transmission has been interrupted in the Region of the Americas and that the requirements established by the WHO Smallpox Expert Committee for considering the disease eradicated have been fulfilled.

RECOMMENDATIONS

Based on the conclusions reached, and to ensure continued freedom from smallpox in the Americas, the Special Commission makes the following recommendations:

1. That countries devote special attention to maintenance vaccination programs, with particular emphasis on primary vaccination, especially of children under five years of age.
2. That countries having direct contact with smallpox-infected areas in other continents, due to international travel, maintain high protection levels in all age groups and exercise careful scrutiny of all persons arriving from smallpox infected areas, to prevent reintroduction of smallpox and its spread in the Americas.

3. That countries utilize staff from all government and nongovernment agencies to assist in the reporting of suspected cases and in performing vaccinations in isolated areas and areas of difficult access.
4. That in border areas the reporting of suspected cases and the maintenance of high levels of vaccination be considered of the utmost importance, and that they be carried out, whenever possible, with close intercountry cooperation.
5. That countries continue to give due attention to reporting systems and to their improvement, particularly in areas where reporting is now weak, in order to have consistent and immediate information on every suspected case.
6. That a sufficient number of adequately trained epidemiologists be made available for epidemiological surveillance services, with each case of suspected smallpox being thoroughly investigated by a competent epidemiologist and specimens, taken under satisfactory conditions, sent to a laboratory.
7. That, in order to improve the coverage of epidemiological surveillance in the rural areas, the necessary means to facilitate reporting be made available to reporting officials, especially those who do not belong to the organized health services.
8. That, smallpox having been eliminated from the Region of the Americas, the laboratory investigation of each and every suspected case be considered of fundamental importance in epidemiological surveillance activities; further, that PAHO/WHO stimulate the establishment of a system to assure the technical proficiency of the laboratories performing smallpox diagnostic procedures.
9. That particular attention be given to improving the collection, packing and dispatch of specimens, to facilitate the utilization of all pertinent laboratory diagnostic techniques.
10. That the countries and PAHO/WHO stimulate information interchange between diagnostic laboratories, whether within the same country or between countries within the Region, and similarly that all countries use the services of PAHO/WHO reference laboratories.
11. That, although the great majority of the countries in the Americas produce and utilize freeze-dried smallpox vaccine, it is important that this practice be extended to the rest of the countries.

12. That, in order to maintain the high level of quality now characteristic of the vaccines produced in production laboratories of the Region, samples of three consecutive lots of vaccine must be sent every four months to the reference laboratories for control.
13. That, to make possible uniform policy in all the countries of the Americas, the Directing Council of PAHO study the possibility of removing the requirement for smallpox vaccination certificates for international travel between the countries of the Americas.

The Commission listened with interest to the excellent and detailed report on smallpox eradication in Brazil and complimented Dr. Eurico Suzart de Carvalho Filho for his clear and effective presentation. The Commission acknowledged at this time a truly historic event: the conquest of smallpox in Brazil.

The Commission considers, in conclusion, that to have eliminated widespread endemic smallpox in so short a time from so large a country through a national program is without parallel in the history of modern public health. This immense achievement deserves the pride of all Brazilians, but especially proud should be all those who participated in this campaign. The Commission congratulates each of those who have been part of this tremendous success.