

*directing council*



PAN AMERICAN  
HEALTH  
ORGANIZATION

XX Meeting

*regional committee*

WORLD  
HEALTH  
ORGANIZATION



XXIII Meeting

Washington, D. C.  
September-October 1971

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Provisional Agenda Item 28

CD20/6 (Eng.)  
CORRIGENDUM  
17 September 1971  
ORIGINAL: ENGLISH

SMALLPOX ERADICATION

Corrigendum to the English Text Only

On Page 23, the last line of the third paragraph should read:

"...under 15 years of age (78 per cent)."

*directing council*



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XXIII Meeting

Washington, D.C.  
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Provisional Agenda Item 28

CD20/6 (Eng.)  
23 August 1971  
ORIGINAL: SPANISH

SMALLPOX ERADICATION

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 410,775 cases are known to have occurred throughout the world between 1963 and 1970, 36,512 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, 191,127 cases of smallpox are known to have occurred between 1948 and 1970 in countries in which the disease was endemic. Table 1 and Figure 1 show the smallpox cases reported for the period 1955-1971.

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

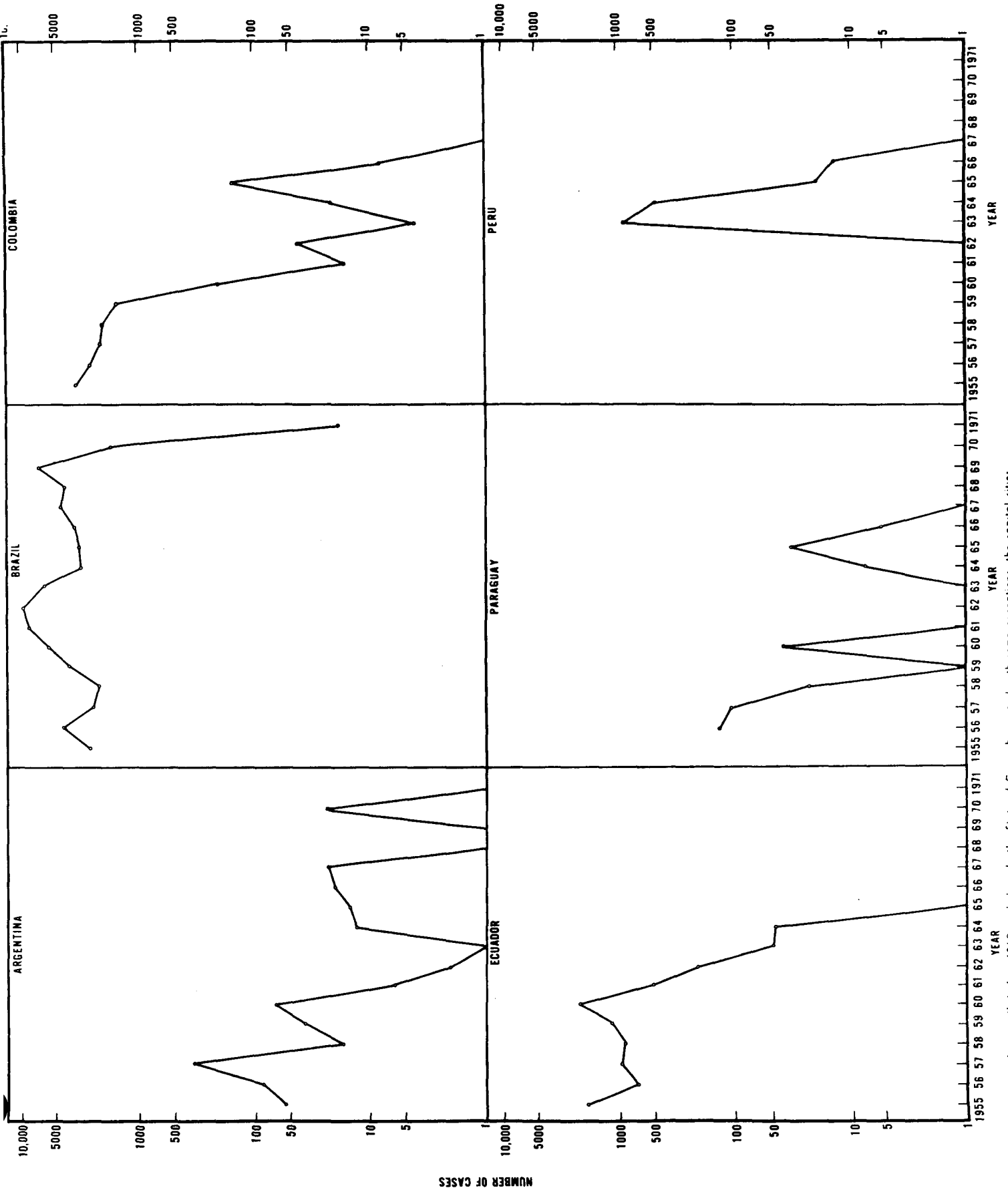
Smallpox Cases Reported in the Americas 1955-1971<sup>a)</sup>

Country	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971(f)
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	c)2385	c)1411	c)1544	c)2958	6018	8546	9583	6433	3076	3269	3518	4514	4372	7377	1771	19
Canada	-	-	-	-	-	-	-	d)1	-	-	-	-	-	-	-	-	-
Chile	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Colombia	3404	2572	2145	2009	950	209	16	41	4	21	149	8	-	-	-	-	-
Ecuador	1831	669	913	863	1140	2185	496	204	45	h)42	-	-	-	-	-	-	-
French Guiana	-	-	-	-	-	-	-	-	-	-	-	-	-	d)1	-	-	-
Panama	-	-	-	b)8	-	-	-	-	-	-	-	-	-	-	-	-	-
Paraguay	57	132	103	21	-	35	-	-	-	7	32	5	-	-	-	-	-
Peru	-	-	-	-	-	-	-	-	865	454	18	13	-	-	-	-	-
United States of America	e)2	-	e)1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uruguay	45	42	2	-	-	b)19	d)1	b)10	d)1	d)3	d)1	-	-	b)2	b)3	-	-
Venezuela	2	g)4	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-
<b>Total</b>	<b>8348</b>	<b>6389</b>	<b>6220</b>	<b>4655</b>	<b>5092</b>	<b>8532</b>	<b>9065</b>	<b>9852</b>	<b>7348</b>	<b>3621</b>	<b>3484</b>	<b>3565</b>	<b>4537</b>	<b>4375</b>	<b>7380</b>	<b>1795</b>	<b>19</b>

- Nil

<sup>a)</sup>Based on official reports received by PASB up to 30 June 1971<sup>b)</sup>Including imported cases<sup>c)</sup>State of Guanabara and the capitals of certain other states<sup>d)</sup>Imported cases<sup>e)</sup>These cases are not in line with the generally accepted rules for the diagnosis of smallpox<sup>f)</sup>First 6 months<sup>g)</sup>Doubtful cases corresponding epidemiologically to chickenpox

FIGURE 1



Note: Data for Brazil, before 1960 include only the State of Guanabara and with some exceptions the capital cities.

Except for one case that occurred in Guatemala in 1953 and sporadic cases reported in Panama in 1947 and 1958, British Honduras 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 1965, 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.

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. This was a challenge similar to the one issued by President Kennedy in 1961 when he set the goal of conquering the moon within ten years, and we hope that we too will succeed in our aim.

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 focused 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 per cent of the population with vaccination marks.
2. Consolidation phase - Countries with less than five cases of smallpox per 100,000 inhabitants and over 80 per cent 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 covered mainly 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 2 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



FIGURE 2

## LABORATORIES FOR THE DIAGNOSIS OF SMALLPOX IN THE AMERICAS



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.

Table 2 and Figure 3 show the production of freeze-dried vaccine for the years 1966-1971. 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 doubtful results obtained.

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 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 new-born children are vaccinated.

TABLE 2  
PRODUCTION OF FREEZE-DRIED SMALLPOX VACCINE IN THE AMERICAS  
1966-1971

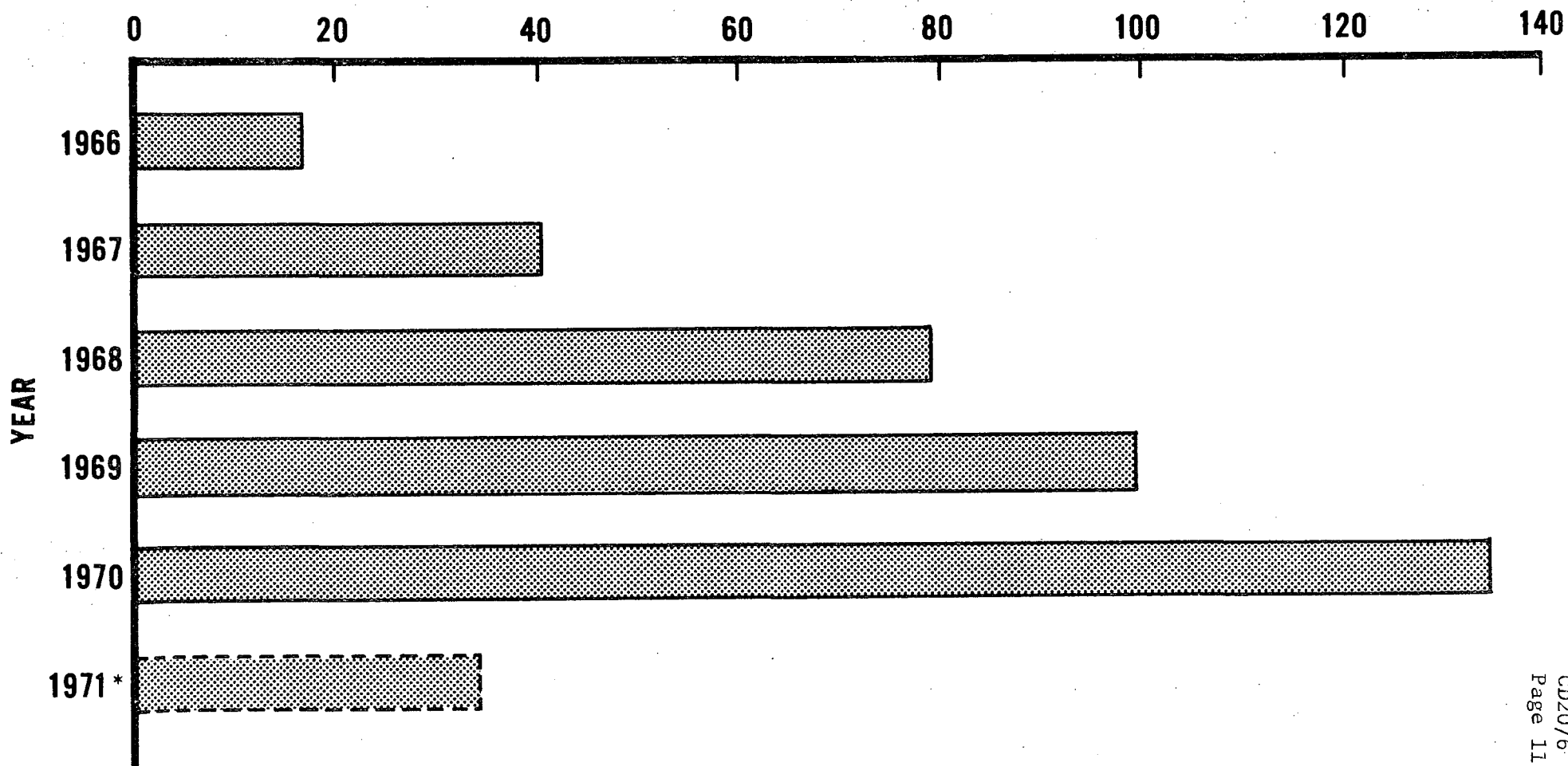
Country	Years					
	1966	1967	1968	1969	1970	1971*
Argentina	-	560,000	14,944,800	21,427,850	44,350,325	7,264,500
Bolivia	1,800,000	400,000	-	230,000	-	-
Brazil	9,386,200	31,331,900	49,482,650	61,000,000	72,298,050	18,669,125
Chile	36,500	693,000	1,962,000	3,950,000	-	250,000
Colombia	2,535,000	4,504,502	7,992,200	7,586,500	10,800,000	3,391,000
Ecuador	2,019,800	1,559,740	-	-	1,800,000	1,223,150
Guatemala	-	-	263,300	-	-	-
Peru	1,033,100	2,220,000	5,848,750	6,527,200	6,227,800	3,318,350
Venezuela	747,000	624,000	-	-	-	-
Total	17,557,600	41,893,142	80,493,700	100,721,550	135,476,175	34,116,125

\* First half

Figure 3

# PRODUCTION OF FREEZE-DRIED SMALLPOX VACCINE IN THE AMERICAS, 1966-1971

MILLIONS OF DOSES OF VACCINATIONS AGAINST SMALLPOX



\* First semester

4. Making the vaccination of health personnel compulsory, particularly of those working in hospitals, and making vaccination of patients in hospitals a mandatory 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.

As shown in Table 1, 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 1969 and 1970 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, it was decided to carry out an investigation 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 focused on the administrative zones of PAHO in South America because its purpose was to identify the countries in which smallpox was still present or 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:

1. Map of the area specifying the localities to be visited
2. Estimated population in the area under study
3. Reporting on localities to be investigated.

The following are to be interviewed in each locality:

Local authorities (intendent, prefect, mayor, etc.)

Health services (health centers, public and private hospitals, dispensaries, malaria posts, etc.). All services are to be visited.

All schools and colleges. Photographs of smallpox cases are to be 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 is to be questioned.

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

4. If cases of smallpox are found or known to have existed in 1971, an immediate investigation must be made.

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 points to be essential:

1. That local health bodies should be instructed to keep particularly alert and to take whatever action is necessary 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 should be enlisted to help implement point 1.
3. That special inquiries should be made in those areas of the country in which the latest smallpox cases were reported or surveillance is less effective. The Organization is prepared to cooperate by providing the advisory services of epidemiologists for this purpose.
4. That a monthly report, including the findings of the above-listed activities, should be submitted to the Organization.

With regard to Brazil, the only country in which smallpox has persisted in an endemic form until recently, additional information has been requested on the problem areas of Amazonia, the San Francisco river basin in the States of Minas Gerais and Bahia and in the State of Goias. A check of the large rural centers which have been mushrooming under the influence of Brasilia has been requested. The shanty-towns of the State of Guanabara, in which the latest reported cases of smallpox occurred, deserve special attention. The State of São Paulo, in which most smallpox cases were registered, should also be given particularly close scrutiny because of the large number of immigrants it receives from other states.

Areas of these regions selected at random are to be investigated by checking vaccination marks in order to ascertain the coverage achieved by vaccination and information on presumed cases and also the absence or presence of smallpox cases detected during the intensive vaccination phase.

The large population centers along the highways under construction in the different regions of the country ought to be closely studied. It is absolutely essential to know the percentage of scars indicative of smallpox or of vaccination among the workers and their families.

At present the investigation is being carried out in the countries of Zone I. In Zone IV, the periodic investigations made in Bolivia, Colombia, Ecuador, and Peru confirm the epidemiological silence that has prevailed there for several years. Table 3 shows the percentages of vaccination marks in these countries for 1970. Table 4 and Figure 4 show the cases of smallpox reported in the four countries from 1960 to 1970. There has been total epidemiological silence in Ecuador since 1963, in Bolivia since 1964, and in Colombia and Peru since January 1967.

In view of the fact, apparent from Table 4, that protection through vaccination is below the 80 per cent recommended as minimum by PAHO/WHO, especially in the case of children under five years of age, the vaccination program has been continued in the countries mentioned to the extent that their budgetary possibilities allow.

Colombia and Peru are continuing the attack phase.

TABLE 3

PERSONS WITH SMALLPOX VACCINATION MARKS  
 BY AGE GROUP AND COUNTRY OF ZONE IV  
 JANUARY TO DECEMBER 1970

Country	Under five years				Five to fourteen years				Fifteen years and above			
	Resident	Present	+	%	Resident	Present	+	%	Resident	Present	+	%
Bolivia	1,923	1,719	1,133	65.9	3,397	2,173	2,002	92.1	6,619	3,665	3,460	94.4
Colombia <sup>1</sup>	-	84,080	59,320	70.5	-	86,680	73,400	84.7	-	157,240	120,480	76.6
Ecuador	10,423	9,464	7,077	74.8	14,949	6,806	6,456	94.9	25,646	13,076	12,476	95.4
Peru <sup>1</sup>	-	10,395	8,503	81.8	-	12,659	11,684	92.3	-	17,443	15,898	91.1
Total	-	105,658	76,033	72.0	-	108,318	93,542	86.4	-	191,424	152,314	79.6

- No data

<sup>1</sup>Partial data



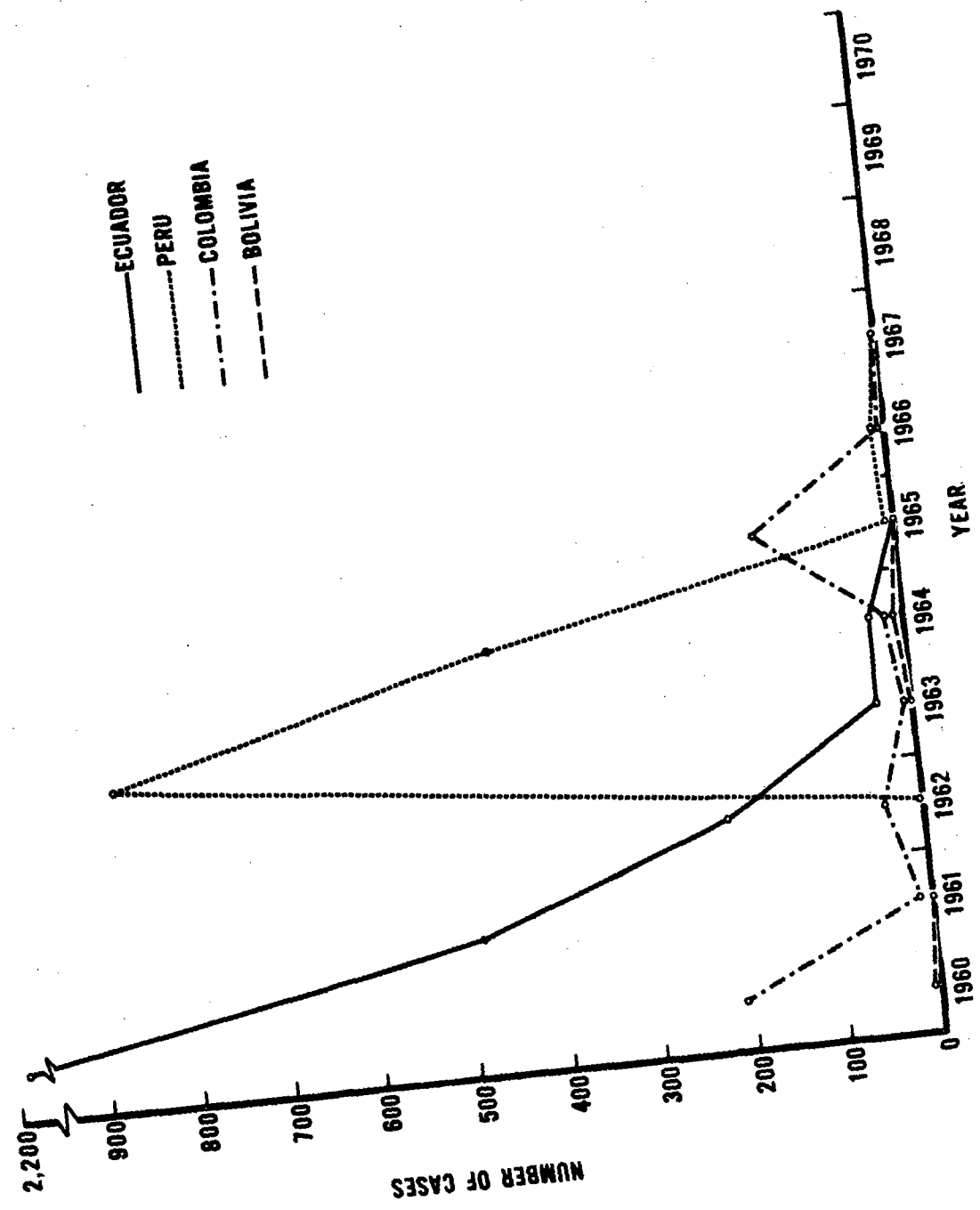
TABLE 4  
SMALLPOX CASES REPORTED IN THE COUNTRIES OF ZONE IV  
1960 - 1970

Year	Bolivia	Colombia	Ecuador	Peru	Total
1960	1	209	2,185	-	2,395
1961	-	16	496	-	512
1962	-	41	204	-	245
1963	-	4	45	865	914
1964	5	21	42 <sup>a</sup>	454	522
1965	-	149	-	18	167
1966	-	8	-	13	21
1967	-	-	-	-	-
1968	-	-	-	-	-
1969	-	-	-	-	-
1970	-	-	-	-	-
Total	6	448	2,972	1,350	4,776

<sup>a</sup>Unconfirmed hospital cases

REPORTED CASES OF SMALLPOX IN THE COUNTRIES OF ZONE IV  
1960-1970

Figure 4



In Colombia it is hoped to complete the general attack phase in December 1971. Up to 31 May 1971 the cumulative total of persons vaccinated since July 1967 was 13,227,394, of whom 3,847,855 were primovaccinated and 9,379,539 revaccinated. The coverage achieved is approximately 70 per cent of the total population.

Since 1970 Peru has been forging ahead with its vaccination program with unusual energy and has earmarked budgetary funds for the period up to 1972, thus avoiding the suspension of activities in the early months of the year, as has happened before. From August 1968 to June 1971 only 2,944,408 were vaccinated, of whom 836,449 were primovaccinated. This is approximately 29 per cent of the total population.

Bolivia and Ecuador are in the maintenance phase. Having no sound structures for ensuring regular maintenance, both countries do their vaccinating by means of vertical programs: in Bolivia in conjunction with BCG and in Ecuador with DPT.

In Bolivia the protection of the group under five years of age is only 65.9 per cent, and the cumulative figure for maintenance vaccination since 1968 is only 31.5 per cent of the population to be vaccinated. For budgetary reasons the production of freeze-dried vaccine has been interrupted, and there is no routine evaluation.

In Ecuador the stress as regards vaccination is on children under five years of age in the maintenance activities. Coverage amounted to 60 per cent of the total population but only 18.2 per cent of the children under five. Between February 1964 and May 1971, 5,164,678 were vaccinated. The laboratory manufacturing freeze-dried vaccine is once again able to produce vaccine that meets WHO standards.

The epidemiological situation in Zone V, consisting of Brazil alone, appears to be quite favorable at present.

Figures 5, 6, and 7 show the area of Brazil covered by the vertical vaccination program concluded in April 1971, the epidemiological situation as of 30 June 1970, and the epidemiological situation as of 30 June 1971, respectively.

Table 5 shows the smallpox cases reported from 1963, when the first stage of the campaign began, to 30 June 1971.

Owing to the fact that, in some states of the northeast, coverage under the campaign was achieved between 1962 and 1966 and maintenance was not yet properly organized, a program to cover these areas again was recently launched. By 30 June, 4,478,124 had been vaccinated in the States of Alagoas, Pernambuco, and Piauí.

Figure 5  
**SMALLPOX ERADICATION CAMPAIGN  
 VACCINATION PROGRAM  
 JUNE 1971  
 BRAZIL**

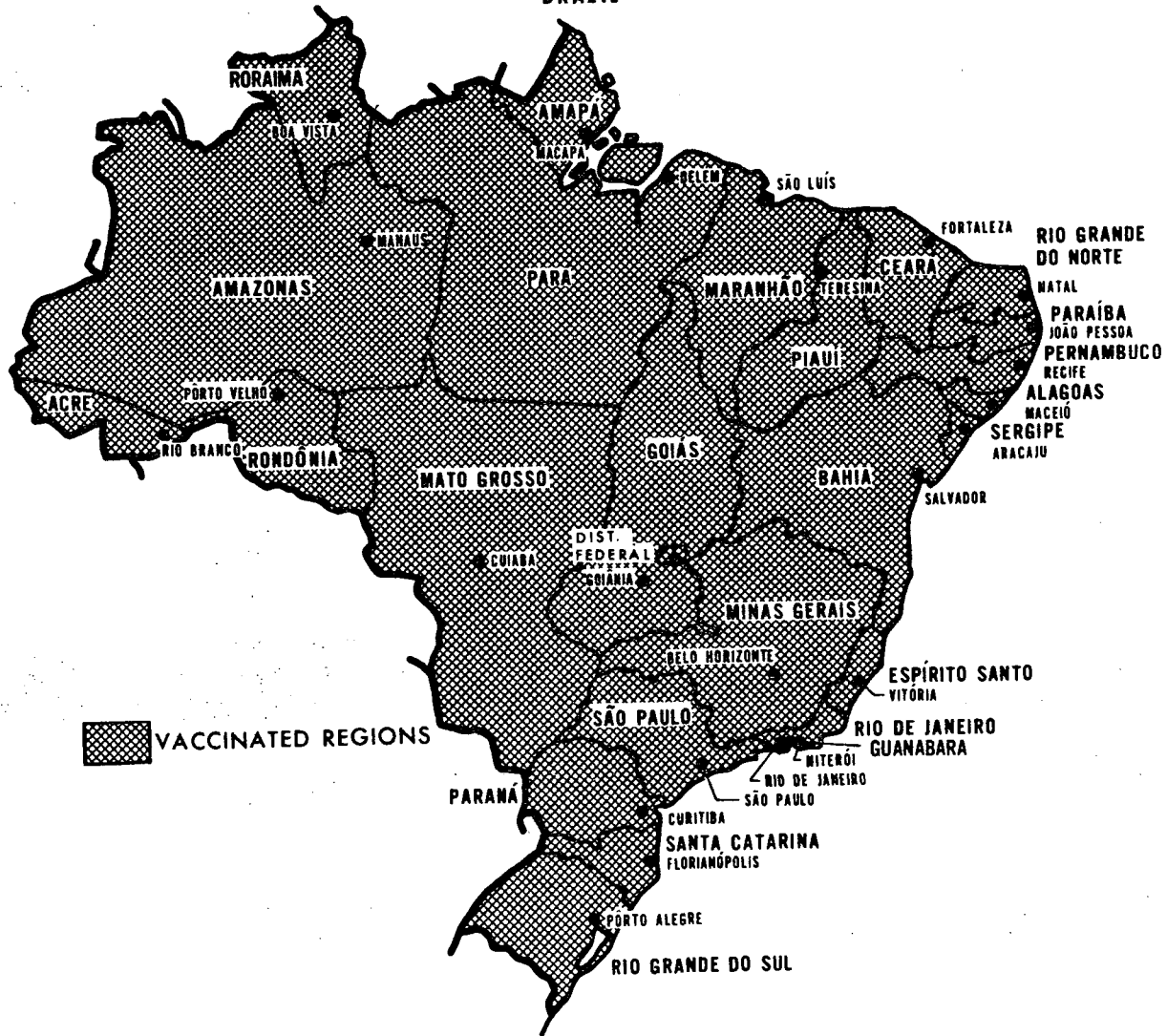


FIGURE 6  
**SMALLPOX ERADICATION CAMPAIGN**  
**BRAZIL**  
**EPIDEMIOLOGICAL SITUATION**  
**JANUARY-JUNE 1970**

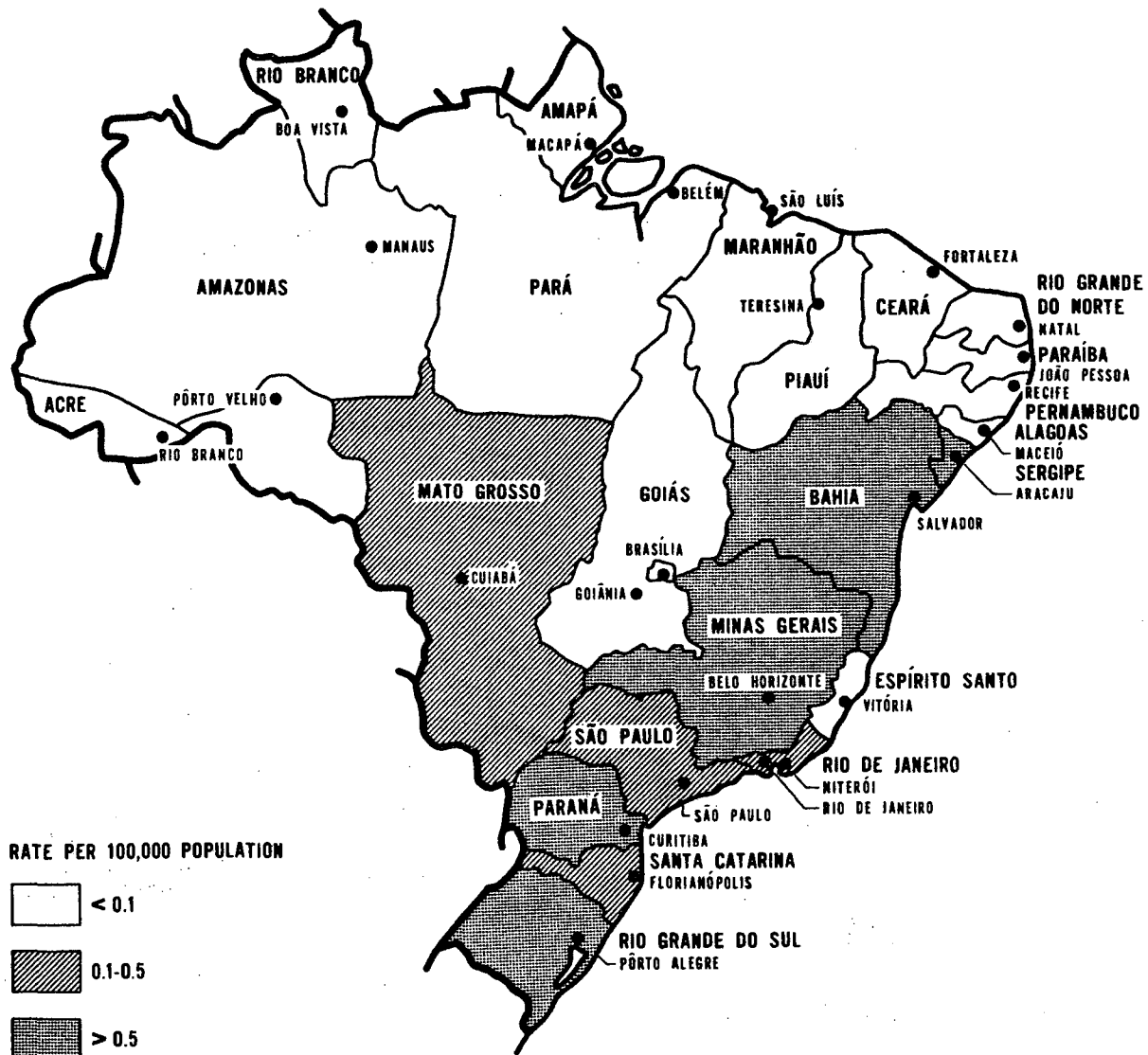


Figure 7

# EPIDEMIOLOGICAL SITUATION ON JUNE 30, 1971 BRAZIL

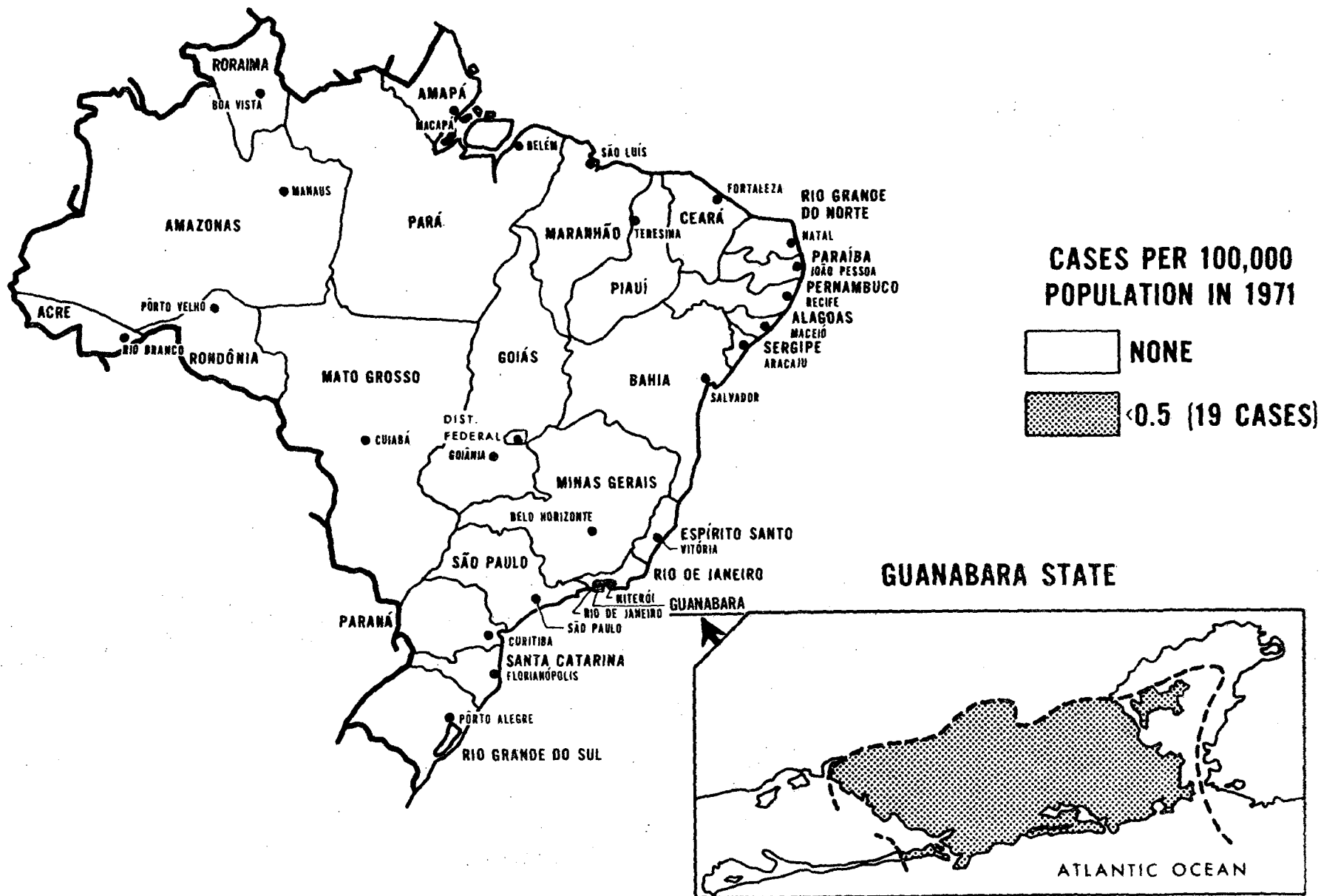


TABLE 5  
SMALLPOX REGISTERED CASES AND DEATHS IN BRAZIL  
1963 - 1971

Year	Population (a)	Number of Cases	Percentage of incidence (b)	Number of of deaths	Percentage of fatal cases (c)
1963	76,409	6,467	8.5	163	2.5
1964	76,211	3,168	4.2	69	2.2
1965	78,587	3,417	4.3	45	1.3
1966	77,492	3,623	4.7	29	0.8
1967	86,580	4,514	5.2	70	1.6
1968	89,376	4,372	4.9	38	0.9
1969	90,892	7,377	8.1	37	0.5
1970	93,551	1,770	1.9	...	...
1971(d)	96,357	19	0.0	-	-

(a) Estimated population of areas reported, in thousands

(b) Per 100,000 inhabitants

(c) Deaths per 100 cases

(d) Provisional (up to June 1971)

... Information not available

In the State of Guanabara vaccination of all the shanty-towns has been completed and is continuing in the rural areas.

Epidemiological surveillance throughout the country is being stepped up, and every suspicious case reported is immediately investigated. By 30 June 1971 there were 2,800 epidemiological surveillance units in existence and sending in reports.

Since the outbreak of September 1970 in the State of Guanabara, no further cases were found in the country until, during the vaccination of the Cruzeiro shanty-town, two suspicious cases were found which, on being investigated, led to the discovery of a well-defined epidemiological chain and to the identification of a total of 18 cases, including 14 among children under ~~five~~ years of age (78 per cent).

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The last case known to have occurred anywhere in Brazil was in the same State of Guanabara during Week 16, which ended on 24 April 1971. The victim was a non-vaccinated adult who had been confined to the Hospital for Communicable Diseases as a pemphigus carrier.

The above-mentioned special investigation is now under way in the State of Guanabara and adjacent areas of the State of Rio de Janeiro. Its purpose is to check on the epidemiological silence which has prevailed there since the end of March. The health centers and schools of both states are collaborating actively.

In the states of Bahia and Minas Gerais, the investigation began in July. In the state of São Paulo, Greater São Paulo has already been investigated for smallpox with negative results. The investigation is continuing in the other areas of the state which are adjacent to Mato Grosso and Minas Gerais.

Table 6 shows data from reporting units in the State of Rio Grande do Sul and the percentage of cases reported during Weeks 18 to 21 of the current year which were taken for sampling purposes.

Table 7 presents the epidemiological situation in Brazil from July 1970 to 1 July 1971. It shows the cases registered by locality and state and the starting date of the last case occurring in each locality. Figure 8 depicts the distribution of the cases given in Table 7.

Figures 9 and 10 show the smallpox cases reported by four-week periods in Brazil from 1967 to 1970 and the cases registered in 1970 by starting date and reporting date. Figure 11 shows the smallpox cases and vaccination activity for Brazil by quarterly period from 1964 to 1971.

It is hoped to consolidate the successes achieved so far on the basis of the special investigations of the problem areas and the surveillance, control, and maintenance activities, which the Government of Brazil is following closely.



TABLE 6  
 CONTROL SHEET SHOWING CASES REPORTED EACH WEEK TO THE  
 SMALLPOX ERADICATION UNIT OF THE DEPARTMENT OF HEALTH OF THE STATE  
 OF RIO GRANDE DO SUL, BRAZIL  
 WEEKS 18 to 21, 1971

State health divisions	Number of municipalities	Population (in thousands)	% of total	Number of Posts	% of cases reported during week							
					21	%	20	%	19	%	18	%
1a	11	1,207	18.2	25	25	100	24	96	21	84	23	92
2a	21	732	11.0	21	19	90	20	95	20	95	18	86
3a	10	583	8.8	10	8	80	10	100	10	100	9	90
4a	12	312	4.7	13	11	85	13	100	13	100	12	92
5a	19	502	7.6	19	17	89	18	95	17	89	17	89
6a	19	368	5.5	17	17	100	17	100	17	100	17	100
7a	9	275	4.1	9	8	89	9	100	9	100	8	89
8a	12	364	5.5	10	8	80	10	100	10	100	10	100
9a	17	310	4.7	16	16	100	15	94	14	88	14	88
10a	9	413	6.2	9	9	100	9	100	9	100	9	100
11a	20	238	3.6	19	18	95	19	100	19	100	19	100
12a	15	280	4.2	14	14	100	12	86	14	100	14	100
13a	20	415	6.2	19	19	100	16	84	18	95	19	100
14a	20	339	5.1	16	16	100	16	100	15	94	16	100
15a	18	300	4.5	13	13	100	13	100	13	100	12	92
<b>Total</b>	<b>232</b>	<b>6,638</b>	<b>100</b>	<b>230</b>	<b>218</b>	<b>95</b>	<b>221</b>	<b>96</b>	<b>219</b>	<b>95</b>	<b>217</b>	<b>93</b>

TABLE 7

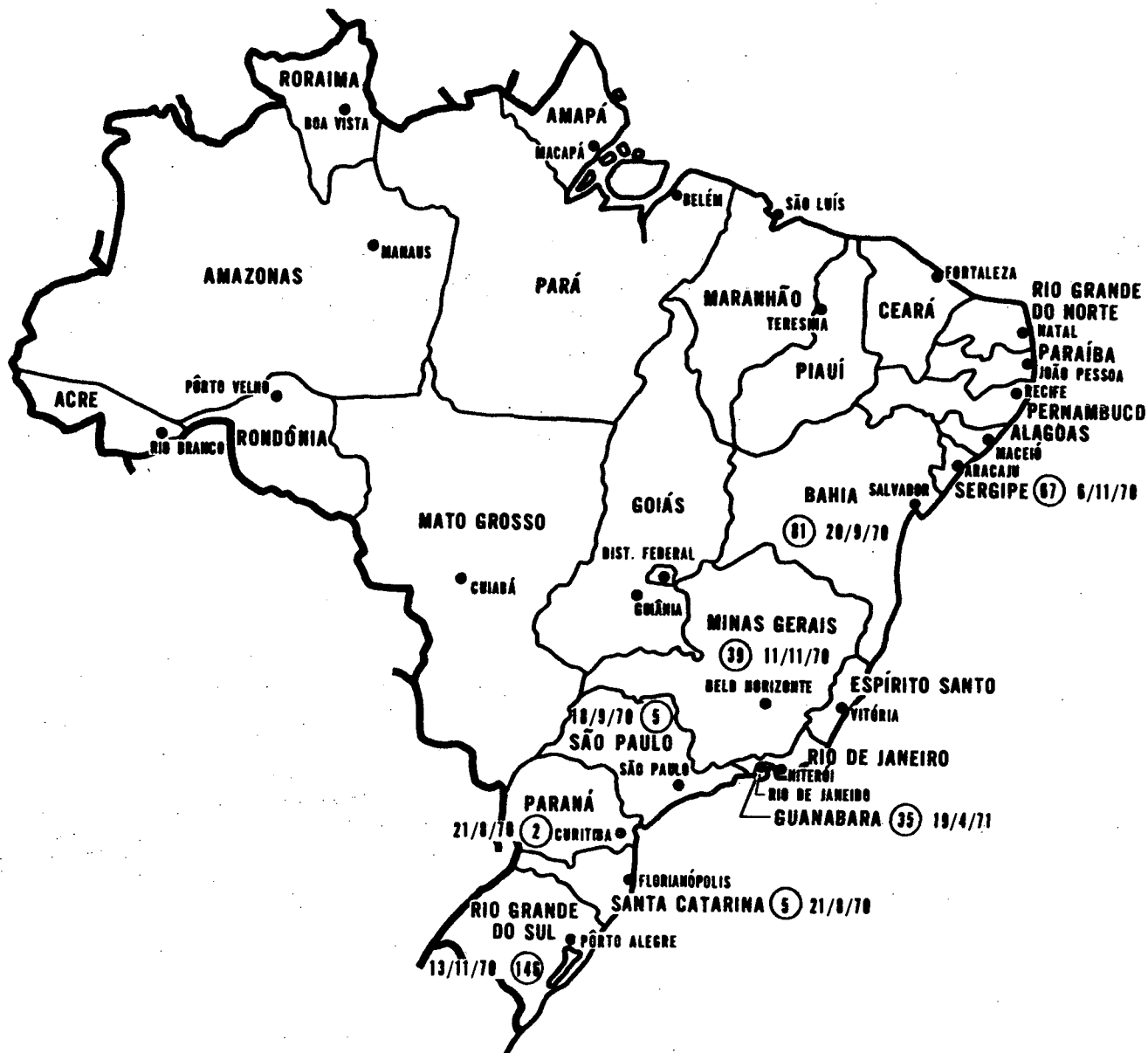
NUMBER OF SMALLPOX CASES REPORTED, WITH STARTING DATE IN  
PERIOD 1.7.70 TO 1.7.71; PLACE AND DATE OF LAST CASE REPORTED  
BRAZIL, 1970 - 1971

State	Number of cases occurring between 1.7.70 and 1.7.71	Starting date of latest case		Municipality	Locality
		1970	1971		
Parana*	2	21.8.70	-	Palmas	Palmas
S. Catarina	5	21.8.70	-	Campos Novos	Portão
São Paulo	5	18.9.70	-	São Paulo	S. Miguel Paulista
Bahia	81	29.9.70	-	Riachão das Neves	Riachão das Neves
Sergipe	67	6.11.70	-	Neopolis	Neopolis
M. Gerais	39	11.11.70	-	Manga	Fazenda Rosado
R. G. Sul	146	13.11.70	-	Fontoura Xavier	Gariroba
Guanabara	35	19.4.71	-	Rio de Janeiro	Hospital Rabelo
Total	380				

\* Imported cases

Figure 8

**SMALLPOX ERADICATION CAMPAIGN**  
**NUMBER OF CASES OF SMALLPOX WITH DATE OF ONSET IN**  
**THE PERIOD 1 JULY 1970 TO 1 JULY 1971 \***  
**BRAZIL**



\* The date of onset of the last reported case appears alongside the circles.

Figure 9

REPORTED CASES OF SMALLPOX BY FOUR-WEEK PERIODS  
1967-1970

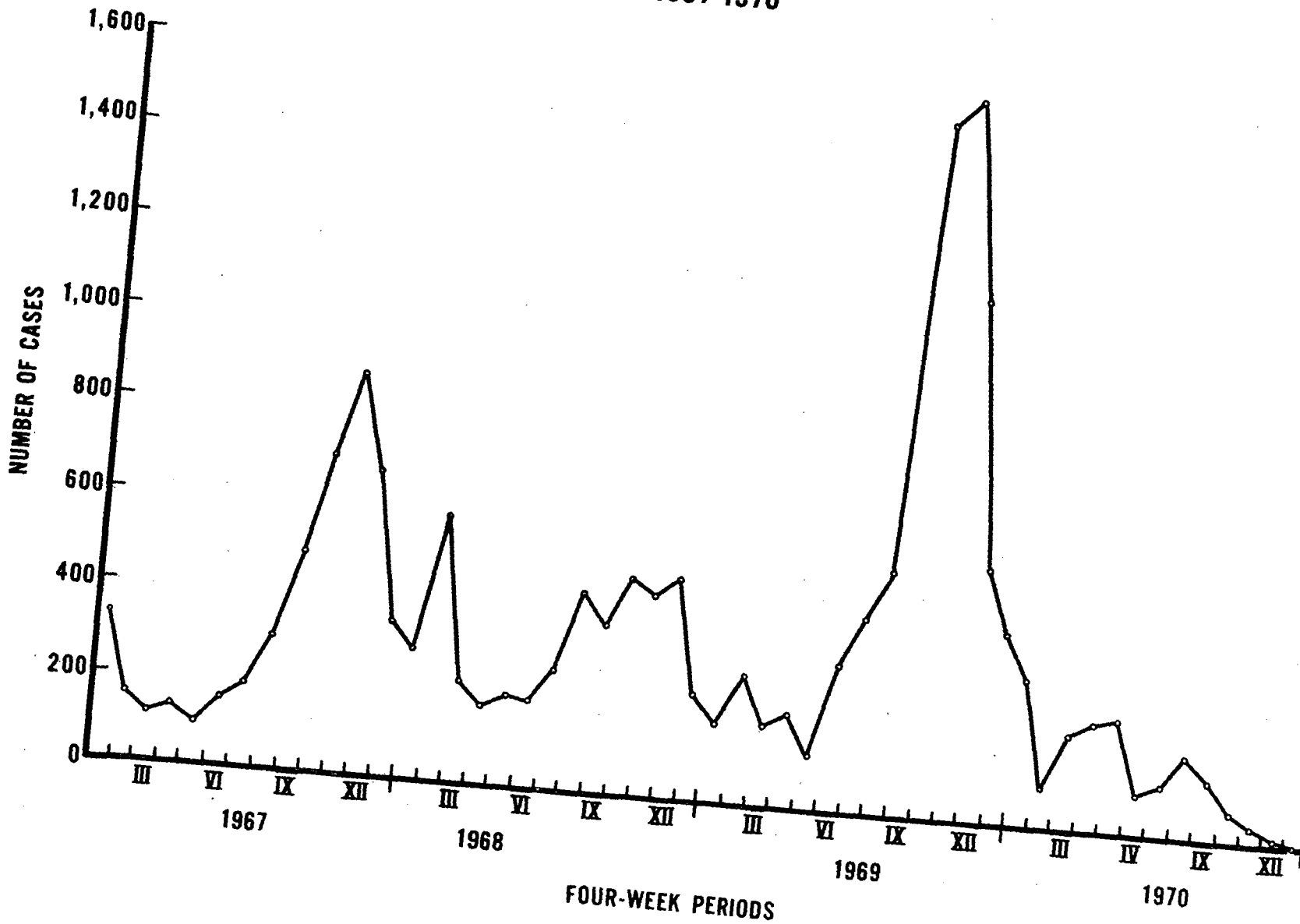


Figure 10

### CASES OF SMALLPOX BY WEEKS OF ONSET AND REPORTING IN BRAZIL 1970

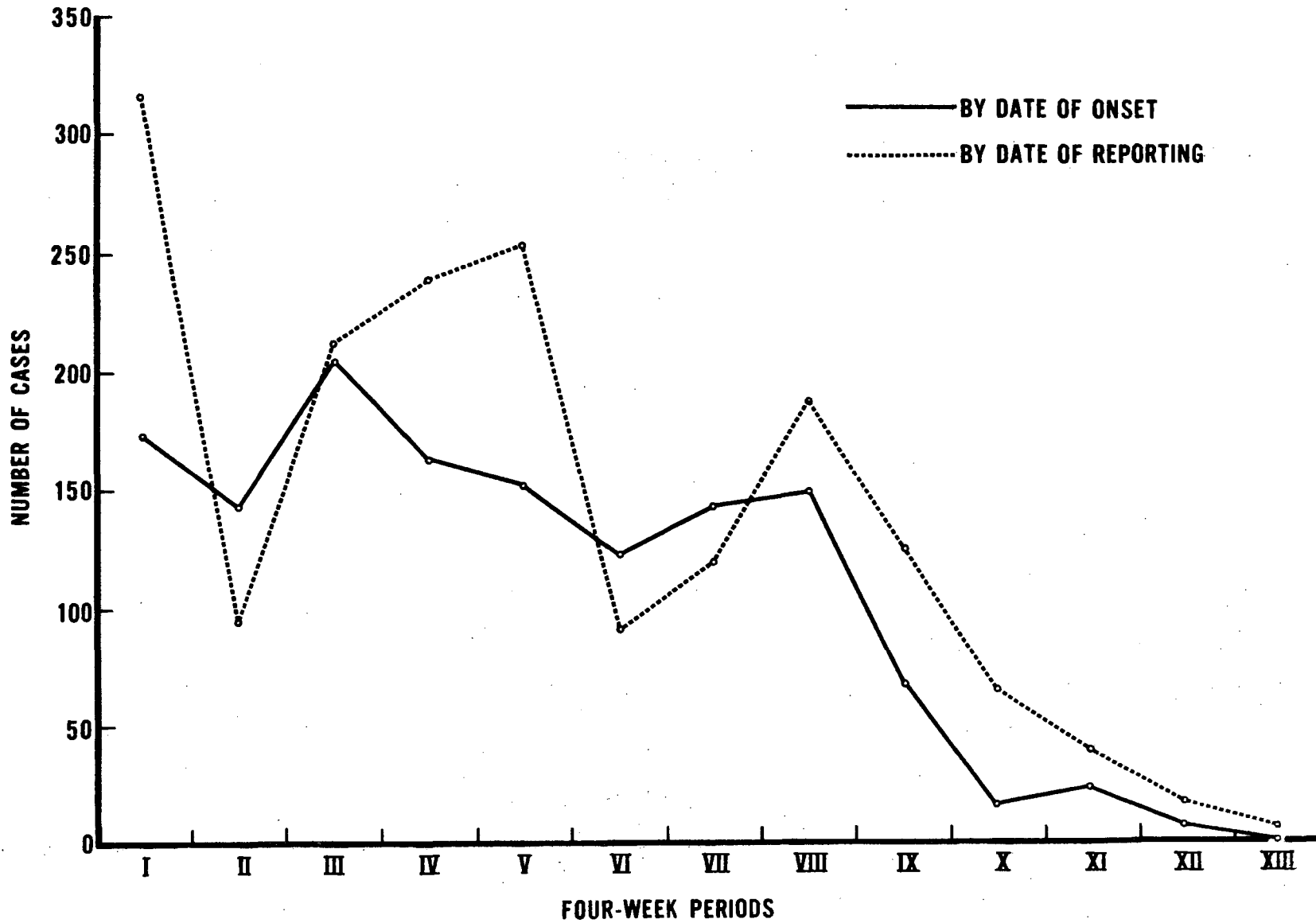
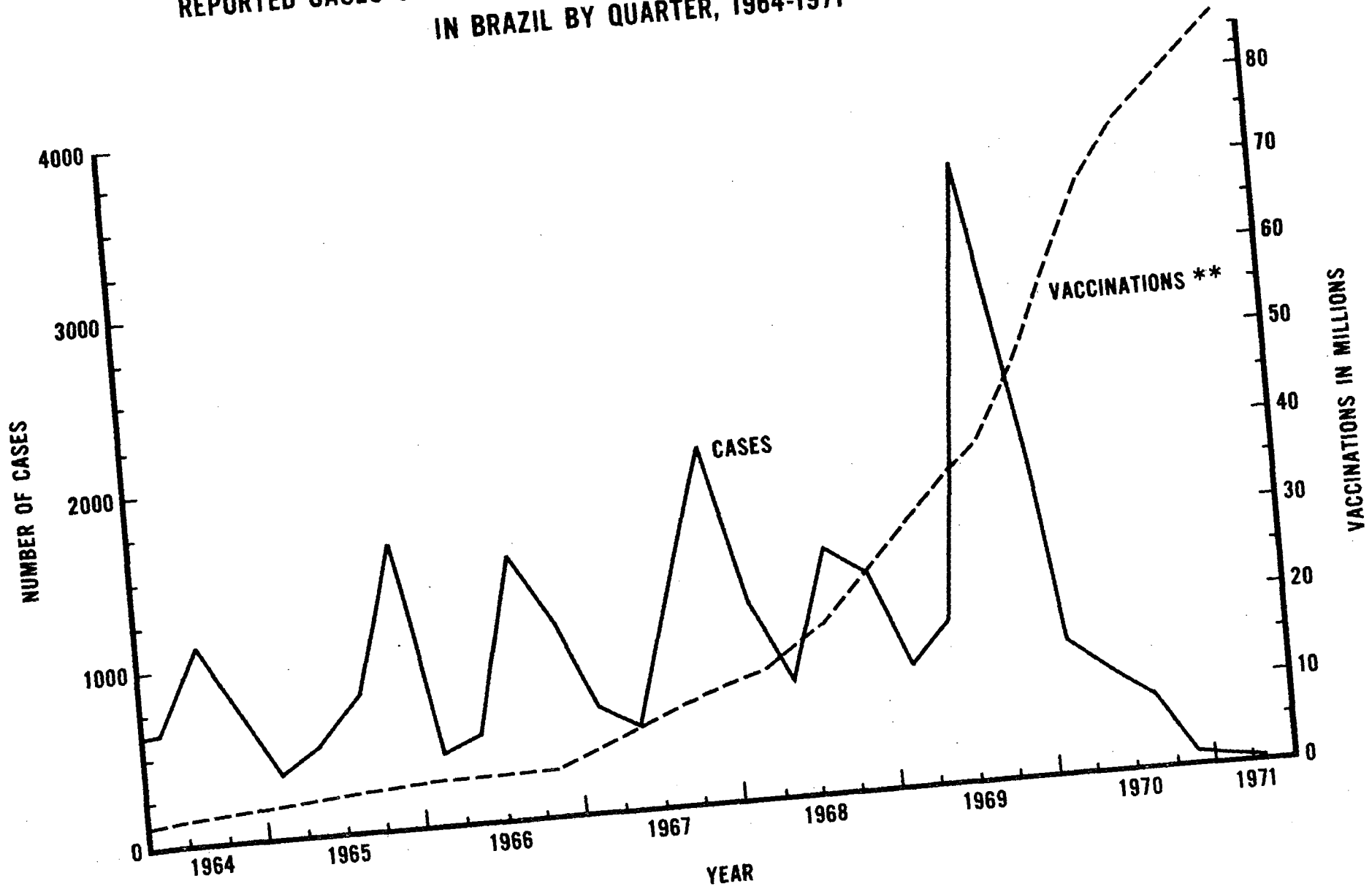


Figure 11

# REPORTED CASES OF SMALLPOX AND CUMULATIVE VACCINATIONS PERFORMED IN BRAZIL BY QUARTER, 1964-1971\*



\* Thru the second quarter.

\*\* Cumulatives since the initiation of the attack phase in 1962.

In Zone VI efforts have been focused on the countries bordering on Brazil because of the risk that the disease may be reintroduced, as has happened on several occasions.

Agreements have been signed and collaboration has been maintained with the Governments in the training of technical personnel for laboratory diagnosis and production of vaccine; advisory services in epidemiology and statistics, and supplies and equipment have been provided, all with a view to promoting a vaccination program that will raise the immunity level of the population.

The need for this strategy became apparent when, after two years during which not a single case was reported, 23 indigenous cases, traceable to a case imported from Brazil, occurred in 1970 in Colonia Alicia, Department 25 de Mayo, Province of Misiones, Argentina.

Financial difficulties had prevented the vaccination programs, which were based on the agreements signed in 1967, from being carried out according to the operational plans drawn up. Nevertheless, Argentina allotted the necessary resources in 1969 and appointed a full-time program director to take charge of the activities. By the end of that year 14.23 per cent of the population concerned had been vaccinated. At present, 17 of the 23 provinces are participating in the vaccination programs through their respective health services.

A short-term adviser, together with the smallpox program director, visited the provinces of the north and northeast, especially Misiones, Entre Rios, Santa Fe, Corrientes, and Chaco, in order to evaluate the program.

In Paraguay the investigation, already completed, was carried out in three main stages:

The first was through the health units using personnel especially trained to investigate schools; it concluded the study of 336 (14.4 per cent) of the countries 3,321 teaching establishments. A total of 35,898 students was interviewed, and no case of smallpox was discovered.

For the second stage, personnel of the National Malaria Eradication Service were used; they covered ten departments and investigated 19,434 housing units with a total of 89,156 people. The results were negative.

The third and last stage was carried out by the Director of the Smallpox Program in Paraguay and a technical officer of PAHO. Eighty-eight localities were visited in areas considered to be the most risky according to available epidemiological data. A total of 125 physicians, 448 directors, and teachers of 73 schools with a total enrollment of 9,252 were interviewed. Questions were asked about the incidence of smallpox in the last 12 months, and this inquiry revealed 12 suspicious cases which simultaneously led to contacts being made with 50 people residing in related areas; the result was negative.

Lastly, the level of protection of the population was found to be satisfactory except for the group of children under five years of age, where it is only 43.3 per cent.

In Uruguay eradication activities are limited by governmental decision to a program for intensifying smallpox vaccination. By June 1971 only parts of the Departments of Colonia and Soriano, all of Florida, and the capital remained to be vaccinated.

The vaccine used is glycerine even though over two years ago PAHO supplied a freeze-drier, and personnel trained to produce vaccine in keeping with WHO requirements are available.

To supplement the investigation throughout South America, a short-term adviser visited Venezuela, French Guiana, and Surinam in order to obtain information on the latest smallpox cases that had occurred in that region, which has kept total silence for many years.

Once all the investigations have been made we will have the data we need to evaluate the activities of the last five years. These data will be submitted for the consideration of a committee of experts to be convened by WHO late in 1971 in Geneva for the purpose of studying the situation of smallpox eradication in the world.

Annex



MAIN PAHO/WHO RESOLUTIONS ON SMALLPOX

Pan American Health Organization

- May 1949 - The Executive Committee, meeting in Washington, D.C., adopted the proposal of the Director to eradicate smallpox.
- October 1950 - The XIII Pan American Sanitary Conference, meeting at Santo Domingo, Dominican Republic, supported the above proposal.
- October 1954 - The XIV Pan American Sanitary Conference, meeting at Santiago, Chile, authorized the Director to allocate \$144,089 to the smallpox program.
- October 1965 - The XVI Directing Council announced that the eradication of smallpox was one of the fundamental objectives of the Pan American Health Organization.
- October 1966 - The XVII Pan American Sanitary Conference authorized the Director to provide the material assistance required by the countries for the purpose of eradicating smallpox from the Continent.

World Health Organization

The Third, Sixth, Eighth, Eleventh, Twelfth, Thirteenth, Fourteenth, Fifteenth, Sixteenth, Eighteenth and Nineteenth World Health Assemblies dealt with the smallpox eradication problem in a series of resolutions.

The Executive Board at its 22nd Meeting authorized, in Resolution 12, the establishment of a Special Smallpox Fund.

The Nineteenth World Health Assembly decided in May 1966, in Resolution 16, to allocate funds for the smallpox program under the responsibility of WHO. The following amounts were allocated from 1967 to 1971:

1967	\$ 39,789
1968	842,000
1969	671,000
1970	682,000
1971	682,000
Total	<u>2,916,789</u>