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REPORT ON THE STATUS OF SMALLPOX ERADICATION IN THE AMERICAS

(Document presented by the Government of Mexico)

"REPORT ON THE STATUS OF SMALLPOX ERADICATION IN MEXICO"

REPORT ON THE STATUS OF SMALLPOX ERADICATION IN MEXICO

I. History

Smallpox was introduced into Mexico along with its discoverers - transported to Mexican territory by the coastal explorations of Francisco Hernández de Córdoba and Juan de Grijalva in 1517 and 1518 respectively, and by the punitive expedition of Pánfilo de Narváez against Cortés in 1520. The first great epidemic was mentioned as taking place in Zempoala, Veracruz State, whence it soon spread throughout the country. On every occasion it caused thousands of deaths and left blinded and scarred victims in its wake. In the end, it took up residence in endemo-epidemic form, with periodic outbreaks every six to ten years, making an effective contribution to the conquest of Mexico.

During the colonial era, the fight against smallpox was of little importance. It amounted to spiritual and material assistance offered to the sick by religious orders, private individuals moved by loving-kindness, and the government, and had the effect of consoling and inducing resignation among the unhappy patients and their relatives.

In 1804, Dr. Francisco X. Balmis brought smallpox vaccine from Spain by arm-to-arm inoculation, a procedure that for some years thereafter was carried on within the country by the so-called "Boards for the Conservation and Propagation of Vaccine" and by various physicians and private persons. This method was of course limited by its very nature to the cities and, within them, to a restricted social group. Part of the urban and all of the rural population was totally ignored, and continued to provide susceptibles who kept the disease endemo-epidemic.

In 1866 Dr. Angel Inglesias introduced bovine serum from France. This event was greeted with such reservations that it led only to academic discussions that produced no practical results for more than fifty years. This did not prevent Dr. Pedro P. Rangel, in 1894, from using the suspicious vaccine for a broad vaccination campaign in the Municipality of Mixcoac, which explains why in that community deaths from the disease reached the vanishing point and new instances of blindness and pockmarking became comparatively rare.

Although the best weapon against smallpox had been available since the beginning of the century and bovine serum since the middle, any campaign that might be started was curtailed, paralyzed, or upset by continuing nationwide turbulence --the result, first of the war of independence, later of the struggles against the empire and foreign intervention, and finally of the 1910 revolution. Such efforts were confined to the cities and a few other areas and their results were unknown, except for the fact that an undetermined number of victims still existed.

From the earliest times, the central region of the country was the most seriously affected, undoubtedly because it had the most people, the chief economic opportunities, the greatest social contrasts, the largest movement of population on agricultural errands and for religious festivals, and the best communications - in short, because it had always been the most important section in every aspect. This would explain why, perhaps by atavism and despite the country's later social evolution, it was precisely here that the last outbreak and the last case of smallpox occurred in 1951, before eradication was declared.

II. Eradication Programs

The real battle began in the present century under epidemiological concepts supplemented by the previously instituted method of arm-to-arm vaccination. This activity originated in the great Mexico City epidemic at the turn of the century. Cases were recorded on a city map and the most seriously affected neighborhoods were immunized by vaccinators strategically stationed in churches, markets, public squares, and so on. The good results argued that a similar practice should be adopted in the major provincial cities suffering under the scourge. Even though the 1910 revolution disorganized this activity, when the new government was consolidated and statistics could be compiled the specific mortality curve was observed to be tending generally downward. After calm returned to the country in 1931, the smallpox campaign was oriented toward the area that had always been forgotten: vaccination brigades appeared in the countryside with bovine serum.

In 1941 and 1942, a rise in the mortality curve was observed. As a result, a meeting of the Chiefs of Coordinated Services was held at the end of 1943, attended also by the chiefs of what were then called Ejidal Services. The conclusion was reached that the campaign ought to be expanded, and that two types of community should be recognized for the purpose: (1) those that had an immediate problem, that faced an emergency because they had low protection indices or were close to affected areas; and (2) those that had no problem, that were distant from affected areas or had at least a temporarily adequate, if not a high, protection index. It was agreed that the basis for the campaign should be to eliminate foci and form protective barriers in the communities of the first group; those of the second could unhurriedly be given simple protection.

By a Presidential Decree of 27 February 1944, a committee was named within the Secretariat of Public Health to carry out the entire program.

In 1948 a new rise in mortality was observed. This led in turn to the creation of the General Administration of the Campaign Against Smallpox, which may be described in the following seven points:

1. It was a centralized, autonomous agency with a budget of its own to develop, direct, and supervise the application program.

2. The country was divided into three zones according to the situation of the disease: a) endemo-epidemic; b) sporadic, and c) intermediate. Work was to start immediately in the first zone with an attack on foci and dispersion routes. Well-trained and - supervised personnel were to vaccinate house by house, village by village, and municipality by municipality.

3. The financing would be provided by a federal budget, supplemented by state allocations.

4. Health education was to be offered, especially in rural areas.

5. The most potent vaccine possible was to be produced.

6. Expert vaccinators were to be used.

7. The cooperation of private initiative was to be promoted.

Under this program, the last outbreak in Michoacan State was suppressed and the last case in the States of Guanajuato and San Luis Potosi was reported in 1951.

After a year during which not a single new case was turned up by epidemiological and laboratory investigations of reported suspects, the disease was declared eradicated on 13 June 1952.

Mexico had suffered from smallpox for 432 years, paying an enormous toll in death, blindness, and disfigurement in every age group.

When arm-to-arm inoculation was adopted, the very nature of the vaccine limited the concept of attack to contacts and neighbors of the cases, and confined action to the cities. In the later work with bovine serum, the concept was broadened to include the elimination of foci and the formation of protective barriers. It did not matter whether the area in question was urban or rural. Finally, the ideal came to be that every inhabitant should display a vaccination scar.

III. Consolidation of Results

The idea of inoculating the entire population was abandoned because of the difficulty of putting it into practice. Within the consolidation stage, two aspects were distinguished:

1. The national. This had been considered and included in the previous or attack stage. It comprised routine vaccinations performed by the public health offices within their jurisdictions - reaching the newborn through the Civil Registers, children through their schools, and the general population through home visits or through the public's direct contacts with the office (health certificates, prenuptial tests, physical examinations, and so on). This was included in the offices' regular

work programs, but it was restricted to their territories, leaving a gap made up of the rural and small-town population not covered by the service.

2. The regional. This was, properly speaking, the objective of the program, which concentrated for ten years (1952-1961) on the rural communities that had suffered from the disease for centuries. Thus this work would supplement that of the health offices within the communities for which protection was desired.

Since the federal subsidy was limited (600,000 pesos), it could not be voted entirely to any one state, to the detriment of the rest. For this reason, the various districts were divided into zones, which were gradually covered year by year under programs similar to those of the attack phase: vaccination house by house, village by village, and municipality by municipality. This lengthened the consolidation phase to ten years. The work can be summarized as follows:

a) Annual financial help under a federal subsidy, proportionate to each district's population and administered by its Chief of Coordinated Services.

b) Drafting of rural vaccination programs, establishing year-to-year sequences.

c) Selection, training, and contracting of vaccinators to form rural brigades.

d) Massive inoculation of the population.

e) Use of glycerinated vaccine.

f) Surveillance, supervision, and control of the vaccinators by personnel of the Coordinated Services and the National Smallpox Protection Program.

During this period, 13,424,280 vaccinations were performed at an average cost of .45 peso per person, not counting the value of the vaccine.

IV. Program for 1962

BACKGROUND: It was becoming apparent that the consolidation phase had been carried on long enough in the anxiety-producing zone, to the disadvantage of other regions of the country. It was also noticed that the personnel of many public health offices were becoming more and more careless with their anti-smallpox work, lulled by the tangible evidence of eradication. The health offices had increased in number until they now cover almost 40 per cent (13,000,000) of the total population and also have more public health doctors and trained personnel. For all

these reasons the need for changes became obvious. The attention and enthusiasm of health personnel to the problem of smallpox protection must be reawakened by means of a program modified in the light of the advances that have been made and of the threat posed by modern forms of communication, which can transport sufferers and reintroduce the disease.

PROGRAM: As a point of departure, an estimate was made of the communities with health offices and of the localities and rural areas without. The former are attended to by the personnel of the offices, and the second by personnel contracted under a federal subsidy (600,000 pesos). Technically, both are under the control and direction of the National Smallpox Protection Program, and the respective programs are set up with identical objectives in the offices of the Chiefs of Coordinated Services throughout the country and specifically in ten districts selected each year. The program will be carried out over a three-year period (1962-1964).

EXECUTION.

General: Within the work localities and zones, the rate of successful vaccinations with the vaccine in use should be determined; it should not be below 75 per cent.

1. Communities with health offices:

   A. Permanent vaccination program.

      a) Vaccination of newborn infants when they are entered in the Civil Register.

      b) Revaccination of children of six to seven years (first year of school).

      c) Revaccination of children of 12 to 14 years (sixth year of school).

      d) Revaccination of young people of 18 to 20 years (in military service for men and at home for women).

      e) Revaccination of the adult population voluntarily or as needed.

   B. Periodic mixed sample.

Every three years 5 or 10 per cent of the population will be sampled. The presence or absence of the vaccination scar will be observed, half of those previously vaccinated will be reinoculated, and the results will be read on the tenth to twelfth day, noting only the observed takes and vaccinoids. If this total is doubled and added to the group without scars, multiplied by 100, and divided by the size of the

sample, from which is subtracted the number of those revaccinated with results that could not be learned, the result is the index of susceptibility. This is corrected in accordance with the error factor obtained upon establishing the relationship of takes observed in primovaccinations read. If the susceptibility index is higher than 50 per cent, the population should be revaccinated in its entirety; if it is below this figure, the permanent vaccination program will be carried on as usual.

2. Localities without health offices and rural areas.

The population will be vaccinated preferably on the bases adopted for the permanent vaccination programs of communities with health offices.

Local programs will be drawn up by agreement between the community health and welfare authorities and the National Smallpox Protection Program in accordance with the following points:

a) A federal subsidy proportionate to the population will be assigned from the Program's annual 600,000 pesos.

b) The subsidy will be used to pay for the training, selection, and contracting of vaccinators for rural areas at the rate of 1 per 20,000 inhabitants.

c) All localities with schools will be included.

d) Vaccination centers will be installed in public buildings (town hall, school, civil registry office, and others).

e) The rural population living along the customary routes of communication between important localities without health offices should be included.

f) Every year ten different districts will be covered, so that local programs in the same district can only be carried out every four years.

SURVEILLANCE AND SUPERVISION

This will be the responsibility of the community's health and welfare authorities and the National Smallpox Protection Program.

Mexico, D.F., 15 May 1962

Annexes

PROGRAMA NACIONAL DE PROTECCION ANTIVARIOLOSA.

INOCULACIONES REALIZADAS EN LOS AÑOS Y POR EL MEDIO QUE SE INDICA.

Años	Of. aplicativas SSA PI	RI	Sub-total	Vac.por subsidio PI	RI	Sub-total	Total PI	Ri	Total de totales.
1952	1.253,855	2.436,212	3.690,067	553,593	1.232,192	1.785,785	1.807,448	3.668,404	5.475,852
1953	1.175,065	3.837,190	5.012,255	492,189	1.745,033	2.237,222	1.667,254	5.582,223	7.249,477
1954	972,703	2.732,511	3.705,214	337,926	1.073,668	1.411,594	1.310,629	3.806,179	5.116,808
1955	1.098,540	3.092,403	4.190,943	317,621	1.053,635	1.371,256	1.416,161	4.146,038	5.562,199
1956	1.037,103	2.174,246	3.261,349	356,591	1.012,832	1.369,423	1.443,694	3.187,078	4.630,772
1957	1.100,555	2.440,693	3.541,248	340,414	826,171	1.166,585	1.440,969	3.266,864	4.707,833
1958	660,417	1.533,074	2.193,491	221,219	674,991	896,210	881,636	2.208,065	3.089,701
1959	1.025,328	2.828,401	3.853,729	458,875	975,110	1.433,985	1.484,203	3.803,511	5.287,714
1960	897,199	2.092,516	2.989,715	225,994	421,625	647,619	1.123,193	2.514,141	3.637,334
1961	446,922	1.037,626	1.484,548	423,449	681,152	1.104,601	870,371	1.718,778	2.589,149
Total	9.717,687	24.204,372	33.922,559	3.727,871	9.696,409	13.414,280	13.445,558	33.901,281	47.336,839

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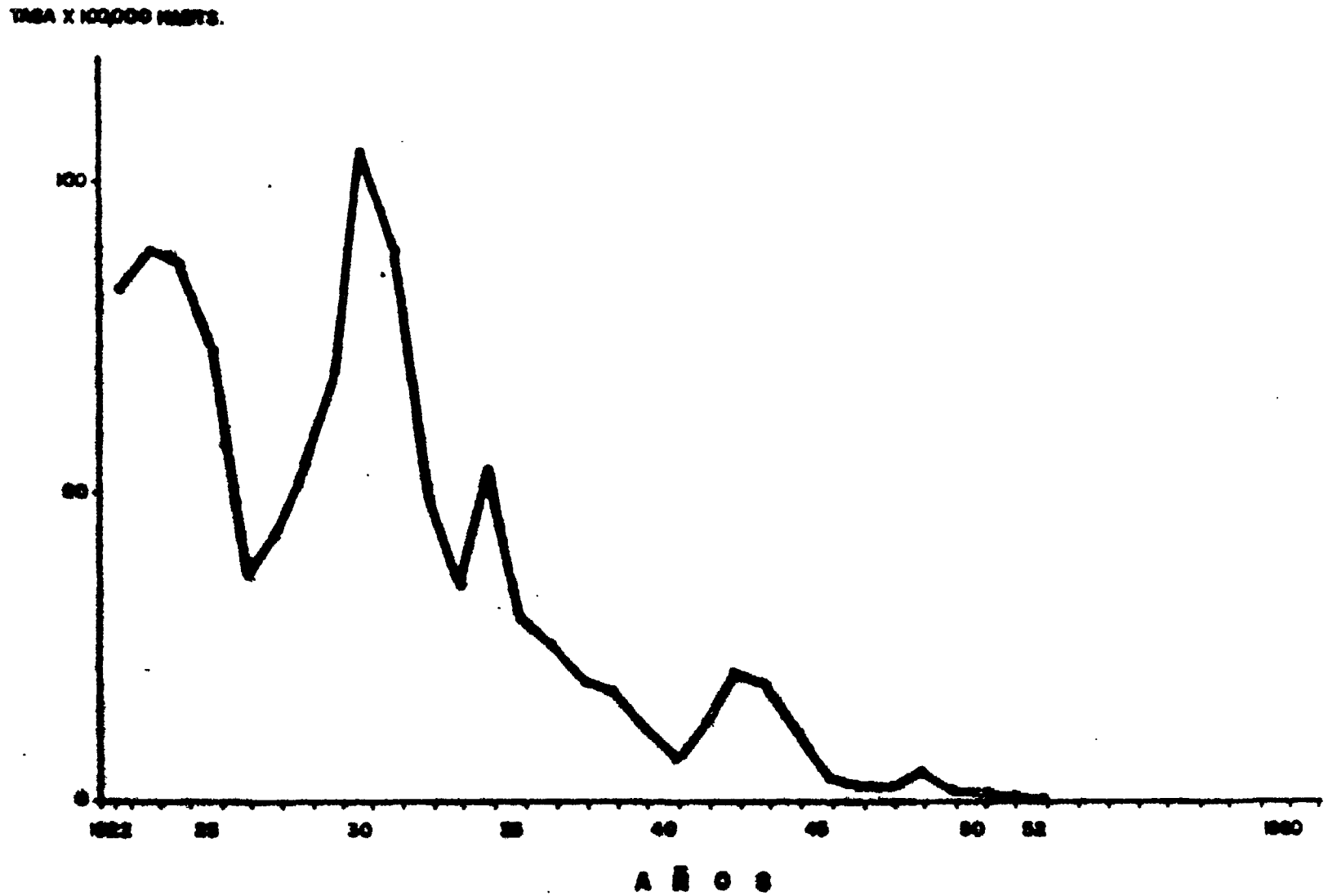
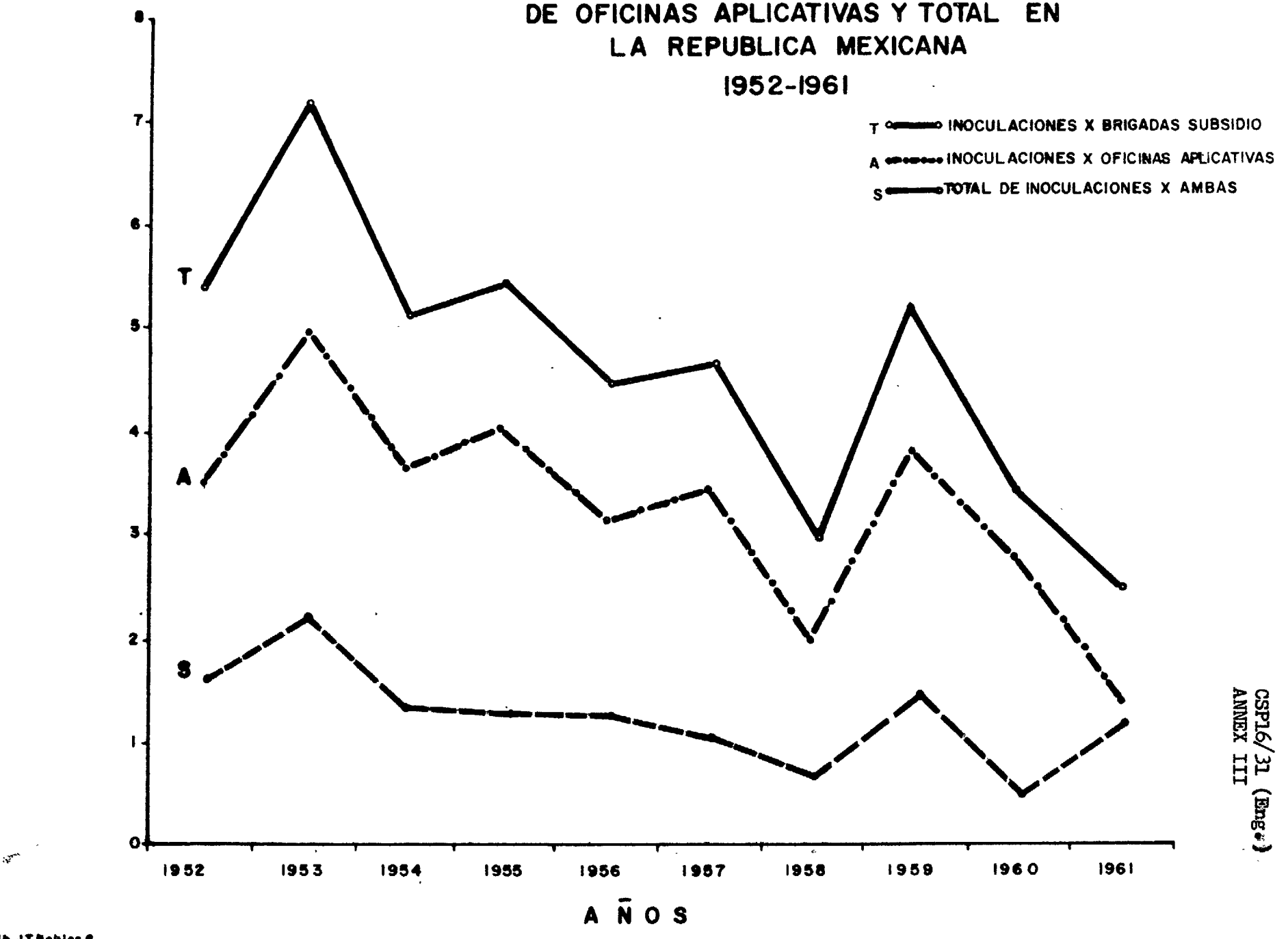
ANNEX I

MORTALIDAD POR VIRUELA EN LA REPUBLICA MEXICANA

1922 - 1961



INOCULACIONES ANTIVARIOLOSAS POR SUBSIDIO DE OFICINAS APLICATIVAS Y TOTAL EN LA REPUBLICA MEXICANA 1952-1961



Dib. J.T.Robles G.

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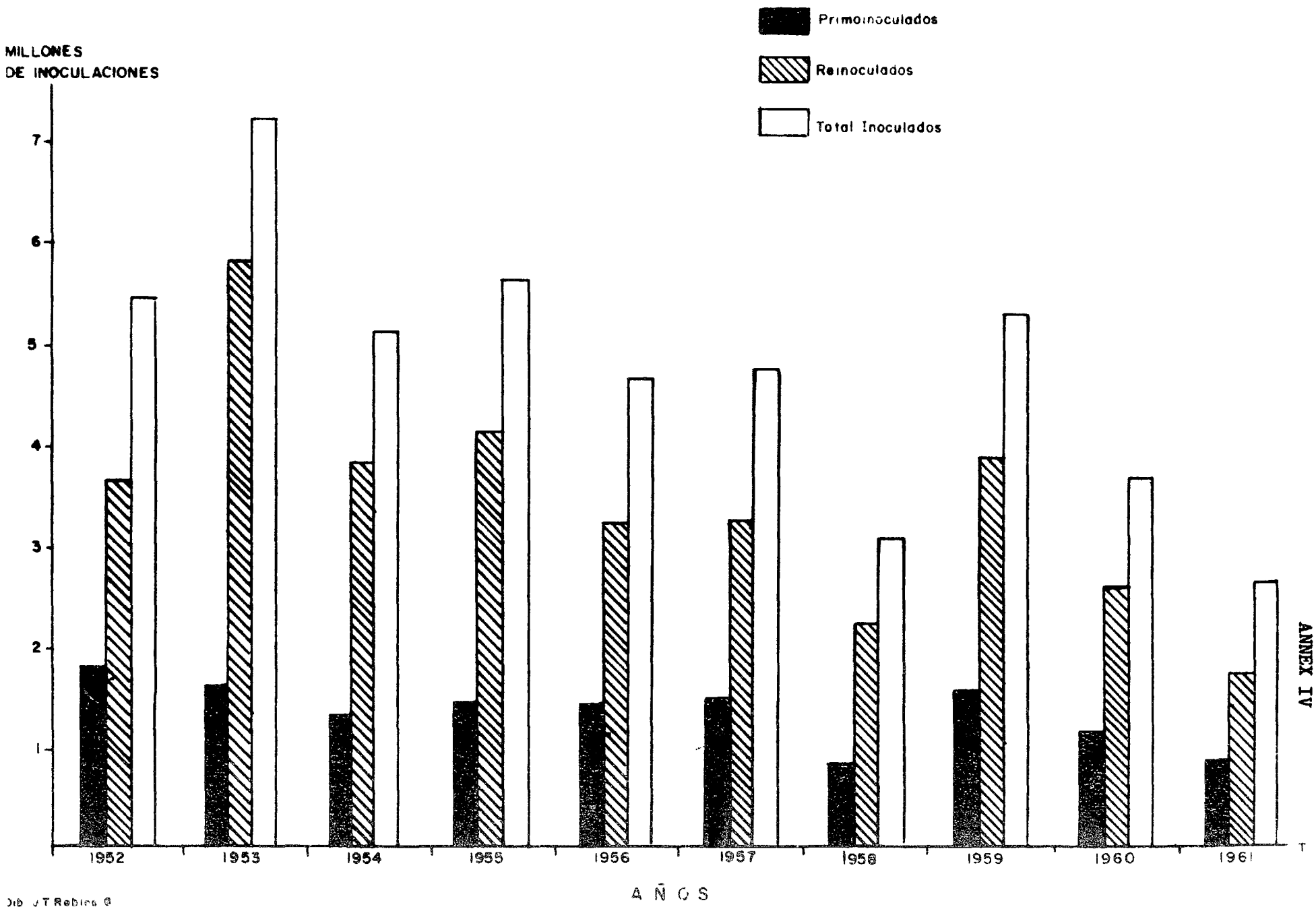
ANNEX III

INOCULACIONES ANTIVARIOLOSAS EN LA REPUBLICA MEXICANA

1952–1961



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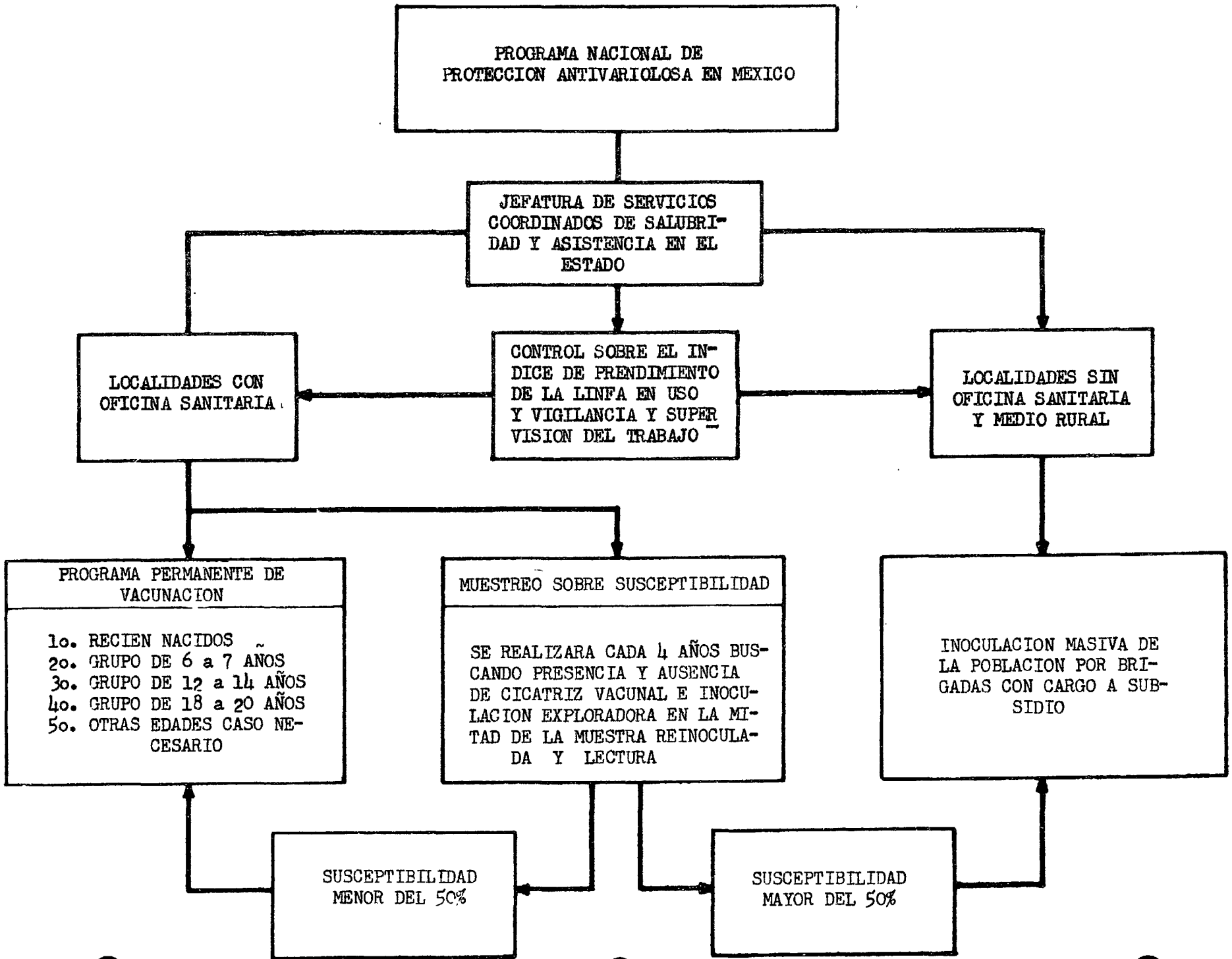
ANNEX IV


PROGRAMA NACIONAL DE PROTECCION ANTIVARIOLOSA EN MEXICO
JEFATURA DE SERVICIOS COORDINADOS DE SALUBRIDAD Y ASISTENCIA EN EL ESTADO
LOCALIDADES CON OFICINA SANITARIA
CONTROL SOBRE EL INDICE DE PRENDIMIENTO DE LA LINFA EN USO Y VIGILANCIA Y SUPERVISION DEL TRABAJO
LOCALIDADES SIN OFICINA SANITARIA Y MEDIO RURAL
PROGRAMA PERMANENTE DE VACUNACION
1o. RECIEN NACIDOS
2o. GRUPO DE 6 a 7 ANOS
3o. GRUPO DE 12 a 14 AÑOS
4o. GRUPO DE 18 a 20 AÑOS
5o. OTRAS EDADES CASO NECESARIO
MUESTREO SOBRE SUSCEPTIBILIDAD
SE REALIZARA CADA 4 AÑOS BUSCANDO PRESENCIA Y AUSENCIA DE CICATRIZ VACUNAL E INOCULACION EXPLORADORA EN LA MITAD DE LA MUESTRA REINOCULADA Y LECTURA
INOCULACION MASIVA DE LA POBLACION POR BRIGADAS CON CARGO A SUBSIDIO
SUSCEPTIBILIDAD MENOR DEL 50%
SUSCEPTIBILIDAD MAYOR DEL 50%

JTRobles G