REPRINTED ARTICLE

Articles published elsewhere which are considered by the Editorial Board to be of special interest are, with permission reprinted in full, or in condensed form, or in free translation.

LEPROSY IN THE AMERICAS [1]

LAURO DE SOUZA LIMA, M.D.
Pan American Sanitary Bureau
Washington, D. C.

1. INTRODUCTION

It is well known that leprosy has profound social, economic, and psychologic repercussions and is a source of great concern to the public health and welfare services of affected countries. This concern has been accentuated recently because of the unsatisfactory results obtained in control campaigns in almost all endemic areas of the [South American] continent, results that have given rise to doubt as to the wisdom of the measures applied up to the present.

It is known also that the planning of any leprosy program, whether at the national or the international level, requires the most precise knowledge of the extent of the problem and of the epidemiologic characteristics of the disease in the area under study. From the public health viewpoint, which is the one that concerns us in this paper, a precise knowledge of the status of the leprosy problem in the Americas depends largely on the quantity and quality of the data and information available on the following four basic aspects of the problem:

(1) Endemicity of the disease, i.e., its extent, its potentiality for spread (or severity), and the trend it is following.

(2) The control organization designed to combat it, i.e., the health organizations responsible for preparing and executing the control programs, and the resources available to them.

(3) The orientation of the campaign, meaning the procedures adopted in executing the planned programs, and also the legislation supporting them.

(4) The results of the campaign, evaluated by well-defined and uniform criteria and appraised also in relation to the time factor.

Only through an appraisal of these different but closely interrelated

[1] Presented at the PASB/WHO Seminar on Leprosy Control, Belo Horizonte, Brazil, June 30-July 7, 1958. Reprinted, by permission of the editor, from the *Boletin de la Oficina Sanitaria Panamericana* 45 (1958) 472-493, in a translation supplied by courtesy of the director, Pan American Health Organization, Washington, D. C. The translation is not in all respects identical with the original, the changes evidently editorial. In the last section the author's notes on six countries were omitted entirely, but condensations of them have been included here.—EDITOR.

aspects is it possible to judge the present status of the leprosy problem from the public health point of view. A document presented at the PASO meeting in Antigua, Guatemala, in September 1956, will serve as a basis for the present study.

Needless to say, it is almost impossible at this time to evaluate the leprosy problem in the Americas on as broad a basis as the one outlined above, because of the lack of data on the subject. There was not sufficient time to consult with the health specialists and administrators in the various countries in order to complete and bring up to date the existing information.

Despite the obvious imperfection of this presentation on the leprosy problem in the Americas, it will serve the purposes of the Seminar, which are to give the participants the opportunity to bring up to date the information and data it contains and to pass judgment on the concepts and standards used as a basis for this study.

It is evident that a project of this kind entails a laborious task of compiling statistical, epidemiologic, and administrative data, and for that reason it would be essential to cite the sources of information that lend the data authenticity.[2]

2. ENDEMICITY

For the purposes of this paper, three aspects of endemic leprosy in the Americas are of basic importance: its extent and density, its potentiality for spread, and the trend it is following.

Extent.—An effort has been made to evaluate the extent of endemic leprosy in the Americas on the basis of the prevalence rates recorded for each area, even though we are aware that these figures do not reflect the true situation because in almost all of the areas no leprosy censuses have been made. The prevalence rates were determined on the basis of the number of patients registered per 1,000 inhabitants.

Data were obtained on 53 political regions of the Americas. With the exception of Alaska, the Aleutian Islands, Newfoundland, the Falkland Islands, Continental Chile, and Petit Terre, all other regions represent endemic foci of variable extent. The data on the prevalence rates are tabulated in Table 1.

On the basis of the above prevalence rates, although they do not reflect the true situation, the endemic areas in the Americas can be classified into the following groups, according to the extent of endemicity:

A. Very extensive endemicity: rates over 2 per thousand.
B. Extensive endemicity: rates from 1.5 to 2 per thousand.

[2] The principal sources of information used in this paper were, in chronological order:

1. MACHADO ROVIRA, R., GONZALEZ PRENDES, A. and CRUZ BAEZ, R. Distribución y prevalencia de la lepra en las Américas. Rev. Sifilog. Leprol. y Dermatol. **11** (1955) 4-9.
2. BICA, A. N., ROMAN, J. and SAENZ, A. C. El problema de la lepra en las Americas. Bol. Of. Sanit. Panamericana **42** (1956) 548-556.
3. [LEONARD WOOD MEMORIAL] Leprosy Briefs **7** (1956) 41-44; 45-48.
4. Reports to the Pan American Sanitary Bureau, and certain data taken from literature on the subject.

C. Medium endemicity: rates from 1 to 1.5 per thousand.
D. Low endemicity: rates from 0.5 to 1 per thousand.
E. Very low endemicity: rates of less than 0.5 per thousand.

TABLE 1.—*Extent of the endemic areas in the Americas, according to prevalence rates.*[a]

Region	Year	Population	No. of cases	Prevalence rate per 1,000 inhabs.
North America				
Alaska	1951	100,000	..	..
Aleutian Islands	1951	2,300	..	..
Greenland	1952	18,500	..	..
Canada	1953	14,756,000	15	0.001
Newfoundland	1953	400,000	..	..
United States	1955	156,306,000	400	0.002
Mexico	1954	28,052,513	11,378	0.45
Bermudas	1954	40,000	1	0.025
Central America				
Guatemala	1957	3,497,880	77	0.022
British Honduras	1952	78,004	1	0.012
Honduras	1955	1,555,664	40	0.026
El Salvador	1957	2,347,889	61	0.026
Nicaragua	1957	1,331,322	100	0.075
Costa Rica	1957	1,033,128	493	0.47
Panama	1957	911,100	121	0.13
Greater Antilles and Bahamas				
Cuba	1956	5,813,000	4,204	0.72
Puerto Rico	1951	2,000,000	436	2.18
Jamaica	1957	1,608,407	563	0.35
Haiti	1955	3,097,220	7	0.002
Dominican Republic	1955	2,346,391	223	0.09
Bahamas	1954	85,000	14	0.016
French Antilles				
Guadeloupe	1955	300,000	1,372	4.72
Martinique	1955	240,000	1,865	6.9
Désirade	1951	3,000	91	26.42
Marie-Galante	1950	16,000	39	2.43
Les Saintes	1950	1,700	10	5.87
Saint Martin	1950	4,000	10	2.50
Petit Terre	1950	500	..	..
Saint-Barthélemy	1950	3,000	7	2.33
Lesser Antilles (British, United States, Netherlands)				
Saint Kitts, Nevis, Anguilla	1953	52,056	50	0.90
Antigua	1954	49,692	96	1.93
Dominica	1953	54,000	15	0.27
Saint Lucia	1955	82,958	20	0.24
Saint Vincent	1954	72,711	20	0.27
Grenada	1955	86,000	7	0.07
Trinidad-Tobago	1955	616,603	884	1.40
Barbados	1953	219,015	66	0.30
British Virgin Islands	1953	13,000	20	1.53
U.S. Virgin Islands	1952	24,874	25	1.005
Netherlands West Indies	1955	181,000	13	0.07
South America				
Argentina	1956	18,509,066	9,572	0.52
Bolivia	1956	3,019,031	951	0.31
Brazil	1957	60,080,000	121,314	2.02
Chile	1956	6,024,961	37	0.002
Colombia	1956	12,107,810	9,155	0.75
Ecuador	1955	3,439,000	150	0.04
French Guiana	1955	27,863	1,341	48.0
Surinam	1956	250,000	2,197	0.87
British Guiana	1957	500,000	1,403	2.80
Paraguay[b]	1957	1,638,000	2,014	1.22
Peru	1954	8,591,300	1,127	0.13
Uruguay	1954	2,523,000	62	0.024
Venezuela	1956	5,377,508	8,648	1.04

[a] Prevalence rates based on numbers of registered cases per thousand population.
[b] Investigation of leprosy cases not yet completed.

On the basis of this classification it can be shown that, taken as a whole, the American continents with an estimated total of 340,075,946 inhabitants and with 169,723 registered leprosy cases could be classified

as an area with very low endemicity, with a prevalence rate of 0.49 per thousand.

On the same basis, its large geographic regions could in turn be classified as shown in Table 2.

TABLE 2.—*Classification of regions of the Americas according to the extent of endemicity.*

Region	Population	No. of cases	Prevalence rates	Classification
North America	191,656,803	11,794	0.05	Very low
Central America	9,423,665	793	0.84	Low
Greater Antilles and Bahamas	14,940,018	5,447	0.36	Very low
French Antilles	586,200	3,394	5.97	Very extensive
Lesser Antilles	1,399,909	1,215	0.86	Low
South America	122,087,351	158,071	1.29	Extensive

GROUPING BY ENDEMICITY

Considered individually, the political subdivisions of the Americas would be classified as follows:

A. Areas with very extensive endemicity:

1. French Guiana	48.00	7. Saint Martin	2.50
2. Désirade	26.42	8. Marie-Galante	2.43
3. Martinique	6.90	9. Saint-Barthélemy	2.33
4. Les Saintes	5.87	10. Puerto Rico	2.18
5. Guadeloupe	4.72	11. Brazil	2.02
6. British Guiana	2.80		

B. Areas with extensive endemicity:

1. Antigua	1.93	2. Brit. Virgin Islands	1.55

C. Areas with medium endemicity:

1. Venezuela	1.64	3. Trinidad and Tobago	1.40
2. Paraguay	1.43	4. U.S. Virgin Islands	1.005

D. Areas with low endemicity:

1. Saint Kitts, Nevis, etc.	0.90	4. Cuba	0.72
2. Surinam	0.87	5. Argentina	0.52
3. Colombia	0.75		

E. Areas with very low endemicity:

1. Costa Rica	0.47	14. Ecuador	0.04
2. Mexico	0.45	15. Nicaragua	0.075
3. Jamaica	0.35	16. Honduras	0.026
4. Bolivia	0.31	17. El Salvador	0.026
5. Barbados	0.30	18. Bermudas	0.025
6. Dominica	0.27	19. Guatemala	0.022
7. Saint Vincent	0.27	20. Uruguay	0.014
8. Saint Lucia	0.24	21. British Honduras	0.012
9. Bahamas	0.16	22. Chile	0.002
10. Peru	0.13	23. Haiti	0.002
11. Panama	0.13	24. United States	0.002
12. Dominican Republic	0.09	25. Canada	0.001
13. Neth. West Indies	0.07		

The most superficial analysis of these prevalence rates suffices to show, what is well known, that the figures for each area taken sepa-

rately do not provide the sanitarian or the public health administrator with an indication of the magnitude of the health problem in the area where he is to work. One need merely consider the prevalence rates in the areas with the most extensive endemicity to see that, with the ex-

TABLE 3.—*Density of endemic leprosy in the larger American regions, per 100 km².*

Region	Area[a]	No. of cases	Density
North America	23,404,427	11,794	0.05
Central America	543,576	793	0.15
Greater Antilles and Bahamas	224,909	5,447	2.42
French Antilles	2,863	3,394	1.53
Lesser Antilles	10,458	1,215	11.6
South America	18,199,122	158,071	0.87

[a]According to Rovira *et al.* Distribución y prevalencia de la lepra en las Américas. *Rev. Sif. Lep. y Dermat.* (Cuba) **11** (1955) 4-9.

TABLE 4.—*Density of endemic leprosy in the political units of the Americas per 100 km².*

Region	Area	No. of cases	Rate per 100 km²
Alaska	1,552,000	..	..
Aleutian Islands	37,840	..	..
Greenland	2,250,000	..	..
Canada	9,660,000	15	0.001
United States	7,841,000	400	0.005
Mexico	1,951,367	11,378	0.58
Bermudas	50	1	..
Guatemala	109,000	77	0.07
British Honduras	22,400	1	..
Honduras	113,000	40	0.03
El Salvador	34,126	61	0.17
Nicaragua	128,000	100	0.008
Costa Rica	48,550	493	0.01
Cuba	114,524	4,204	3.8
Puerto Rico	9,314	436	4.7
Jamaica	10,896	563	5.9
Haiti	28,700	7	0.024
Dominican Republic	50,070	223	0.44
Bahamas	11,405	14	0.018
Guadeloupe	1,603	1,372	85.6
Martinique	939	1,865	20.02
Désirade	66	91	13.7
Marie-Galante	149	39	26.14
Les Saintes	18	10	55.5
Petit Terre	5	..	..
Saint Martin	52	10	19.2
Saint Barthélemy	21	7	33.3
Saint Kitts, Nevis, etc.	539	50	99.4
Dominica	754	15	1.9
Antigua	524	96	18.3
Trinidad and Tobago	4,838	884	18.2
Saint Lucia	602	20	3.3
Saint Vincent	500	20	4.0
Grenada	345	7	2.03
Barbados	430	66	15.3
Netherlands West Indies	991	13	1.3
British Virgin Islands	..	..	..
U. S. Virgin Islands	351	25	7.1
Argentina	1,020,490	9,572	0.93
Bolivia	1,310,000	951	0.07
Brazil	8,511,000	121,374	1.4
Chile	741,000	..	..
Colombia	1,172,000	9,155	0.78
Ecuador	443,000	150	0.03
French Guiana	78,200	1,341	17.2
Surinam	142,822	2,197	1.5
British Guiana	231,700	1,404	0.65
Paraguay	159,000	2,014	1.20
Peru	1,388,000	1,127	0.08
Uruguay	186,000	62	0.03
Venezuela	1,024,490	8,648	0.84

[a]Areas indicated by Rovira *et al.* in the article cited previously.

ception of Brazil, they do not in reality represent health problems of major significance.

Density.—The density of endemic leprosy was determined on the basis of the relation between the number of registered cases and the size of the area.

On this basis, the American region as a whole, with 169,723 registered cases and a total area of 42,385,335 km², shows an endemic density of 0.404 per 100 km². The larger geographic regions, taken separately, would have the densities tabulated in Table 3.

For each of the political units of the Americas taken separately, their density rates per 100 km² are those shown in Table 4.

The same comment made with respect to the extent of endemicity is applicable to the density rates of endemic leprosy in any area, for those rates alone do not give an indication of the magnitude of the health problem. In both cases, however, the rates acquire significance when related to the most important characteristic of the endemic, which in our opinion is its potentiality for spread, or severity.

Severity, or potentiality for spread.—The severity of the endemic, or its potentiality for spread, is revealed by the percentage of lepromatous-type cases, those capable of spreading the infection. In this respect, account also must be taken of cases in the indeterminate and borderline groups which are bacteriologically positive and could possibly represent sources of infection, thereby contributing to the disease's capacity to spread.

The potentiality for spread is in itself extremely important to the public health worker, and it is even more important when related to the prevalence and density rates of endemic leprosy, for it is then necessary to relate the basic factors in the dissemination of the disease: the number of individuals capable of spreading it (percentage of the contagious forms), and the number of persons that may possibly be exposed to the infection.

Because leprosy is essentially a family disease, knowledge of its

TABLE 5.—*Percentage of contagious forms in 12 endemic areas of the Americas.*

Region	No. of cases	No. of Lepromatous cases	Percentage
Mexico	5,349[a]	4,519	86.46
Guatemala	77	63	81.81
Costa Rica	493	281	56.90
Cuba	4,204	2,319	55.16
Jamaica	563	327	58.08
Dominican Republic	223	101	45.24
Bolivia	951	.....	51.20
French Guiana	1,341	223	17.00
British Guiana	1,403	314	22.30
Paraguay	2,014	826	41.00
Venezuela	8,872	4,086	46.05

[a]No information available on 5,503 cases of the total of 11,378 registered.

potentiality for spread as related to the foci index—that is, the number of contacts exposed to the infection (contacts of lepromatous foci)—assumes fundamental importance in the evaluation of the problem of leprosy from the public health viewpoint. Unfortunately, in this respect we have available only few and inadequate data concerning the endemic areas in the Americas. The status in 12 of these areas can be seen in Table 5.

The usefulness of these figures is evident also in evaluating the results of the activities of the leprosy control programs, when the percentage of the clinical forms of new cases observed annually is established, as will be explained later in this paper.

Trend of endemicity.—A study of the distribution curves of cases registered by age groups gives some indication of the trend of endemic leprosy—whether downward, upward, or static—particularly when these curves are related to the clinical forms. It is known, moreover, that the endemicity trend can be changed with the application of control measures, a change that is observed clearly when the distribution by age groups according to clinical form is studied.

In this respect, too, we lack sufficient data on the endemic areas, so that we are still unable to evaluate the trend of the endemic in these areas. Table 6 shows the distribution by age groups of cases registered in 6 regions of the Americas.

TABLE 6.—*Percentage distribution by age groups of cases registered in six regions of the Americas.*

Region	Age groups	
	Up to 15 years	Over 15 years
Mexico	10.00	90.00
Guatemala	5.16	94.84
Costa Rica	6.06	93.94
Cuba	9.98	90.02
British Guiana	53.92	46.08
Paraguay	11.60	88.40

The figures given are obviously inadequate as a basis for evaluating the trend of endemicity, since they are not related to the clinical form of the disease. Moreover, there was no uniform criterion for this distribution, since from area to area the breakdown by age groups varied. It is therefore not possible to make a comparison between the findings from different areas, or even from the same area, in order to relate them to the statistical data on the population in each group.

3. ORGANIZATION OF CONTROL SERVICES

The leprosy control services in the various areas of the Americas are in different stages of development, ranging from newly established agencies which are only now starting their programs, to complex organizations comprising numerous and diversified services. In the ma-

jority of them, however, there is a lack of balance among the component services, and in almost all of them the magnitude of the health problem is unknown.

Moreover, the relationships between the specialized antileprosy services and the general health services are extremely varied, and only in exceptional cases are the two integrated; and when there is such integration the public health workers usually lack specialized training.

Tables 7/8[3] shows the status of the services responsible for the leprosy control programs, according to the number of health units that comprise them.

Technical personnel.—In Table 9 are given data on the technical personnel working in health units which were given in the issues of

TABLE 7/8.—*Health units for (a) isolation (leprosaria, sanatoria, and wards in general hospitals) and (b) for outpatient treatment, in the endemic areas of the Americas.*

Region	Isolation			Outpatient		Year
	Units	Capacity	Isolated	Units	Registered	
Canada	1	..	9	..	..	1954
United States	6	..	400	..	..	1956
Mexico	2[a]	560	1,231	23	9,340	1954/53
Guatemala	1	100	44	1[b]	33	1958
Honduras	[c]	..	..	1	35	1955
Nicaragua	1	68	67	1	..	1957
El Salvador	..	..	..	1	..	1957
Costa Rica	1	177	166	2[d]	329	1958
Panama	1	..	..	..	..	1955
Cuba	2	760	679	10	2,888	1954
Puerto Rico	1	..	64	..	..	1951
Jamaica	1	200	116	10	447	1958
Dominican Republic	1	200	177	1	..	1955
Bahamas	1	..	14	..	..	1951
Guadeloupe	1[e]	..	104	3	..	1955
Martinique	1	150	148	2	1,200	1955
Saint Kitts	1	54	30	..	.	1954
Antigua	1	45	..	1	44	1955/54
Dominica	1	24	15	..	..	1955
Saint Lucia	1	20	12	1[f]	8	1955
Saint Vincent	1	16	20	..	..	1953
Grenada	1	16	7	..	..	1955
Trinidad and Tobago	1	..	229	6	455	1955
Barbados	1	175	28	1	38	1955/53
British Virgin Islands	1	92	10	..	..	1955
U. S. Virgin Islands	1	..	24	..	..	1952
Argentina	9	2,275	1,537	3	658	1954
Bolivia	3	130	86	..	865	1956
Brazil	38	24,000	22,954	93	41,694	1950/57
Chile	1	40	13	..	..	1954
Colombia	2	..	6,507	11	..	1956
Ecuador	1	..	137	..	..	1955
French Guiana	2	160	130	3	..	1953
Surinam	3	675	551	1	1,646	1955
British Guiana	1	326	244	6	936	1958
Paraguay	1	..	..	12[g]	..	1957
Peru	3	570	..	7	..	1951
Uruguay	..	..	62	..	..	..
Venezuela	2	1,150	..	175	..	1956

[a] In addition, the Mexican services have available wards in general hospitals.
[b] The dispensary in Guatemala is located in the leprosarium itself.
[c] Honduras has 8 beds in the general hospital.
[d] The dispensaries in Costa Rica are part of the outpatient dermatology clinic of the San Juan de Dios and Social Security General Hospital.
[e] The leprosarium previously located on Désirade was transferred to Guadeloupe, apparently serving all the French islands except Martinique.
[f] Outpatients in Santa Lucia receive treatment at the Castries Health Center.
[g] In Paraguay there are 10 specialized dispensaries: 3 are in health centers, and 7 in general hospitals.

[3] In Table 7/8 the original Tables 7 and 8 are combined as a space-saving device. Where in the "year" column two years are indicated, the first pertains to the isolation data and the second to the outpatient section.—EDITOR.

Leprosy Briefs for November and December 1956. Dashes indicate lack of information.[4]

TABLE 9.—*Technical personnel working in health units in the endemic areas of the Americas.*

Region	Technical Personnel			
	Medical		Nursing	
	Full Time	Part Time	Full Time	Part Time
Canada	–	3	1	–
Mexico	–	11	30	–
Guatemala	–	2	1	–
Costa Rica	–	7	2	–
Cuba	18	16	11	–
Jamaica	6	10	–	–
Dominican Republic	1	2	8	–
Guadeloupe	1	–	5	–
Saint Kitts, Nevis	1	–	1	–
Antigua	–	1	1	–
Dominica	–	1	1	–
Saint Lucia	–	1	3	–
Saint Vincent	–	1	1	–
Grenada	–	1	–	–
Trinidad and Tobago	1	3	7	–
Barbados	–	1	2	–
British Virgin Islands	–	3	1	–
Argentina	–	40	45	–
Bolivia	1	1	1	–
French Guiana	1	–	6	–
Surinam	–	4	55	–
British Guiana	1	–	11	–
Paraguay	11	1	–	–
Uruguay	–	1	–	–
Venezuela	8	8	14	–

Financial resources.—From only 15 regions is there information—also from *Leprosy Briefs*—on the financial resources available to the services responsible for antileprosy programs, without reference to the allotments for the general health services. The available information is tabulated in Table 10.

Preventoria.—The institutions known as preventoria or school-homes (*educandarios*), where healthy children of leprosy patients are cared for, are for the most part maintained by private organizations subsidized by the governments. According to the information available, the following are official establishments of this sort which are integrated in leprosy services: one of the 33 in Brazil; one in French Guiana, which also operates a day-nursery in the general hospital; and those in Costa Rica, Jamaica, and Colombia. These establishments, with the exception of the ones in Colombia, do not as a rule conduct control activities but rather perform social welfare functions.

[4] Seventeen of the regions of preceding tabulations are omitted for lack of information, including the United States with its heavily-staffed leprosarium at Carville, La., Panama Canal Zone with its Palo Seco leprosarium, and Argentina and Brazil with their many institutions.—EDITOR.

TABLE 10.—*Financial resources of the leprosy services in 15 regions of the Americas.*

Region	Currency	Budget[a]	Year
Saint Kitts	Dollar, BWI	20,507	1953
Bahamas	Pounds	3,500	1954
Antigua	Dollar, BWI	27,900	1954
Dominica	Dollar, BWI	12,497	1953
Saint Lucia	Dollar, BWI	4,505	1953
Saint Vincent	Dollar, BWI	7,500	1953
Trinidad and Tobago	Dollar, BWI	279,646	1955
Barbados	Dollar, BWI	50,000	1953
Martinique	Francs	3,000,000 (L.) 1,322,663 (D.)	1954
Argentina	Pesos	12,422,222 (L.) 180,000 (D.)	1954
Costa Rica	Colons	1,157,000	1957
El Salvador	Dollar, U. S.	2,000	1957
Bermuda	Pound	2,300	1954
Dominican Republic	Dollar, U. S.	40,000	1955
U. S. Virgin Islands	Dollar. U. S.	17,605	1953

[a](L.) = Leprosarium, (D.) = Dispensary.

4. ORIENTATION OF CONTROL WORK

Under this heading it was our intention to record information on procedures used in the antileprosy services for carrying out the essential activities in the control programs: (*a*) case detection, (*b*) surveillance of contacts, (*c*) follow-up of outpatients, (*d*) measures against exposure, (*e*) prevention, (*f*) treatment, (*g*) social welfare and (*h*) health education. Also considered was the legislation supporting the above activities.

Although the available data are scant and insufficient, they do give an idea of the wide disparity in the operation of programs. In most of the endemic areas there is no balance among activities in the various sectors; in almost all of them the activities related to isolation are overdeveloped to the detriment of all others, and in many areas the service is devoted exclusively to isolation.

On the other hand, in most endemic areas the antileprosy legislation predates the recent advances achieved in leprology and is therefore obsolete. All the legislation we know of has the disadvantage of being too detailed and of incorporating specific provisions that would better be left to separate rules and regulations, which might easily be changed according to the needs of the service and the progress made in the leprosy field.

There are some areas which have no special antileprosy legislation, the provisions related to leprosy being included in those covering communicable diseases generally.

5. EVALUATION OF RESULTS

To evaluate the results of the activities of leprosy control programs in the Americas, and at the same time to judge the effectiveness of the

antileprosy services, it is essential to have the following data, covering a five-year period as a minimum:

(*a*) Annual incidence rate, including all cases detected during the year although not all may be new cases.

(*b*) Distribution of these cases by the form of leprosy.

(*c*) Percentage distribution of cases by age groups, according to clinical form.

(*d*) Focus index, i.e., the number of contacts registered, the number of contacts examined, and their relation to the number of cases registered.

(*e*) Number of new cases detected in the surveillance of contacts.

(*f*) Probable duration of the disease in patients registered during the year at the time they are first observed, distinguishing the new cases detected in the surveillance of contacts.

(*g*) Percentage distribution by age groups in relation to the clinical form of the cases registered during the year, distinguishing the new cases detected in the surveillance of contacts.

It is evident that at this time we do not have available all these data for any of the endemic areas, but we do have partial information.

6. INFORMATION CONCERNING CERTAIN ENDEMIC AREAS [5]

Brazil.—Following the change made in 1955 by the National Leprosy Service in the orientation of control services, "through the integration of the specialized activities into those of the polyvalent public health units," a pilot project was conducted in the State of Rio de Janeiro, the results of which were as follows:[6]

"During 1955, through the work of 34 health units, 148 leprosy patients and 1,621 contacts were registered; 943 reexaminations were made of patients and 1,036 of contacts, a total of 17,371 examinations being made for purposes of diagnosis. A survey made in December showed that of 1,206 cases registered in the area of operations of those units, there remained—after deduction of deceased patients, patients definitely discharged, patients who left the region, those isolated in leprosaria, and those whose whereabouts were unknown—a total of 477 patients, of whom 95.7 per cent were receiving regular treatment in those same units. With respect to contacts, of the total of 5,848 registered there remained—after the necessary deductions—a total of 2,640, of whom 2,140 (81.3%) were under effective control. These are encouraging results never before achieved in campaigns planned on a different basis."

In July 1957 [7] the National Leprosy Service reported:

"The results of this experiment justify extending this system, for it is reasonable to expect that the results of the work in other states will be as effective as those obtained in the State of Rio, where 93.2 per cent of the patients and 83.3 per cent of the contacts are under control. There was also a drop in the incidence of cases of the lepromatous form, from 59 per cent in the decade 1946-55 to 42.2 per cent in 1956, and there was at the same time a marked increase in the percentage of indeterminate cases, which during the same decade rose from 27 per cent to 40 per cent in 1956. These results clearly indicate that the cases are being detected in their initial phase, when treatment is speedier and more effective."

---

[5] This part of the original article contained sections dealing with 11 countries, not including Paraguay. The translation in hand contains notes on only 5 countries, including Paraguay. With one exception the tables in those sections are reduced to text tabulations. To complete the presentation, the short sections on Cuba and Peru have been translated and added, as well as selected parts of the longer ones on Mexico, Surinam, Uruguay and Venezuela, all with more or less condensation of text and tables.—EDITOR.

[6] ROSSAS. IV Meeting of Leprologists, Belo Horizonte, 1956.

[7] DINIZ, O. Nova fase da luta contra a lepra no Brasil. VI Medical Congress of the State of Rio de Janeiro, July 1957.

Costa Rica.—By the procedure for case detection and strict surveillance of contacts used by the Leprosy Control Department, the majority of new cases discovered were at the start of the contagious phase, as shown by the figures shown in Table 11.[8]

TABLE 11.—*Probable duration of the disease in contagious cases detected in Costa Rica in 1956 and 1957.*

Probable duration of the disease	Cases in 1956	Cases in 1957
Less than 1 year	17 (50%)	8 (35%)
2 to 3 years	8 (23%)	5 (22%)
4 to 5 years	5 (15%)	5 (25%)
6 to 7 years	3 (9%)	1 (4%)
8 to 9 years	1 (3%)	4 (17%)
10 years or more		

Paraguay.—Paraguay started a leprosy control program in 1957 with an intensive search for cases. By September 1957 the case-detection teams had already examined 221,429 inhabitants, finding among them 897 new cases of the following clinical forms:[9]

Indeterminate group	275 (30.7%)
Tuberculoid type	272 (30.3%)
Lepromatous type	336 (37.4%)
Borderline group	14 (1.6%)

British Guiana.—In British Guiana an intensive case-detection program is being conducted in the school population. This has led to the discovery of a high percentage of incipient cases, as shown by the following figures for 1956 and 1957, during which 67,107 and 55,162 schoolchildren were examined, respectively.[10]

Indeterminate group	31 (17.4%)
Tuberculoid type	142 (79.8%)
Lepromatous type	5 (2.8%)

French Guiana.—French Guiana adopted a strict case-detection system by checking the entire population in the country and has been able to bring about a gradual reduction in the percentage of contagious forms, with a corresponding increase of tuberculoid cases, as shown by the following figures of total cases registered in 1946 and in the period 1952-1956 inclusive.[11]

Among the new cases found in 1954 and 1955 (57 and 34, resp.), the indeterminate cases constituted slightly over one-half in each instance, the tuberculoid cases one-third, and the lepromatous cases about one-sixth (14% and 15%).

[8] Report to PASB/WHO on Leprosy in Costa Rica, 1958.
[9] Report to PASB/WHO on the leprosy program activities in Paraguay, September 1957.
[10] Report to PASB/WHO on leprosy in British Guiana, February 1958.
[11] Report to PASB/WHO on leprosy in French Guiana, 1955.

	1946	*1952-1954 (average)*	*1955*
Indeterminate	642 (55%)	741 (56%)	730 (54%)
Tuberculoid	246 (21%)	361 (27%)	378 (28%)
Lepromatous	273 (24%)	233 (17%)	223 (17%)
Borderline	.....	12 (0.5%)[a]	4 (0.5%)

[a]Borderlines first listed separately in 1953.

Martinique.—The measures adopted in Martinique for the detection of new cases have, in the six-year period 1950-1955, brought to light 127, 110, 99, 112, 193 and 217 new cases, respectively. The data on clinical forms, combined in two-year periods the better to determine the trend, are as follows:[12]

	1950/51	*1952/53*	*1954/55*
Indeterminate	151 (64%)	134 (63%)	236 (58%)
Tuberculoid	29 (12%)	27 (13%)	79 (19%)
Lepromatous	57 (24%)	50 (24%)	95 (23%)

Cuba.—Leprosy is evenly distributed in all of the provinces, in direct proportion with the numbers of inhabitants. The total number of cases is estimated to be 6,000-7,000, of which 17 per cent are hospitalized. About 26 per cent of the cases are lepromatous. The 16-50 years age groups have 72 per cent of all cases. Males predominate slightly over females. Proportionately, the prevalence in the white race is low, while it is high in the colored, the mixed-blood, and the yellow races.

Mexico.—Mexico considers that its leprosy problem, although not of the most serious, is nevertheless important enough to deserve the application of present day knowledge and practices. To that end the old leprosy law has been replaced by one which is in accord with present ideas. Coercion is abolished entirely, especially compulsory segregation, in favor of measures which attract patients to attend medical centers like those existing for other diseases. The dermatologic center, which has replaced the old dispensary, and sulfone treatment are the basis of the present antileprosy campaign. A significant result is that cases are found at increasingly early stages and are treated with minimal disturbance of their regular way of living.

A sanatorium (formerly called leprosarium) is still maintained because it is as yet impossible to eliminate it. The need is recognized of facilities for caring for acute cases, etc., for rehabilitation work, and for the asylum care of complete invalids, with the proviso that voluntary admission and departure is the basis of the modern campaign. The problem of children is also recognized, but without any tendency to return to the preventorium system, which creates more problems than it solves.

[12] Report to PASB/WHO on leprosy in Martinique, 1955.

In the five quinquennial periods since 1930, a total of 11,855 cases has been registered, with the prevalence coefficients per 100,000 of the inhabitants shown in the following tabulation:

Period	*Cases registered*	*Coefficient*
1930-1934	2,449	13.75
1935-1939	3,155	16.31
1940-1944	1,990	9.00
1945-1949	2,089	8.30
1950-1954	2,172	7.69

However, the total number of cases in the country is estimated to be more than 50,000.

The type distribution, in percentages, of the 2,172 cases registered in the 1950-1954 period is as follows: lepromatous, 62; tuberculoid, 24; and indeterminate, 14.

Peru.—The situation of the antileprosy campaign in March 1958 with respect to the number of living known cases was as follows: under observation, 1,022; fugitive or not controlled, 302; discharged as cured, 3. Adding to these 1,327 another 396 known to have died makes a total of 1,723 registered cases.

The records of type distribution as of five-year periods are shown in the following tabulation:

Period	*I*	*T*	*L*	*(?)*
1931-1935	13.0	0.0	87.0	0.0
1936-1940	17.0	3.1	77.5	2.4
1941-1945	28.1	4.4	65.0	2.5
1946-1950	23.6	14.2	59.3	2.9
1951-1955	32.4	15.1	51.8	0.7
Mar. 1958	27.4	11.2	59.6	1.8

Surinam.—There are three leprosaria: (1) Groot-Chatillon (government), which admits adults only; (2) Bethesda, run by the Protestant group, and (3) San Gerardus Magella, run by the Catholic Church. The last two have government subsidy up to approximately 85 per cent of their total expenses.

Almost all of the registered cases, except those who have absconded (35) and some "bush-negroes" who live far in the interior, are under medical attention and routine treatment with DDS. The patients are examined every 3 months, except the quiescent cases and the bush-negroes who are examined twice a year. Patients permitted by the leprosy service to live under home isolation are under the regular control of the medical and nursing personnel of the service. Arrested cases are examined once or twice a year; they are kept under maintenance treatment for more than three years. Contacts are examined twice a year, and are given the Mitsuda test; at the end of 1957 there were 510 contacts (114 adults and 396 children) under observation. Children with the tuberculoid and indeterminate forms of the disease who are

bacteriologically negative, and some suspect cases, attend a special kind of school.

The following figures are the indices of prevalence, by type and in total, for three of the years between 1950 and 1957.

Year	*I*	*T*	*L*	*Total*
1950	0.05	1.62	3.80	5.57
1954	0.30	2.10	4.00	6.42
1957	0.29	2.25	2.00	4.55

Uruguay.—Uruguay has a detailed leprosy law, and a leprosarium with one doctor, but compulsory segregation is not practiced. It is estimated that there are more than 1,000 cases, but there has been no leprosy census; the actual number may be only 500 (there were 228 known cases in 1929). The predominant type is the lepromatous one, and the indeterminate are more numerous than the tuberculoid cases. Males far exceed females in ratio.

The leprosarium—in the Fermin Ferreira Hospital, which is primarily for tuberculosis—consists of two wards for lepromatous cases, one with 40 beds for men and the other with 30 beds for women. There are no children inmates. Foreigners, who are about 20 per cent of the total population, make up 29 per cent of the inmates.

In general, leprosy patients attend the dermatology polyclinics, and most of them receive ambulatory treatment. The training in leprosy of the general practitioners is inadequate. An Antileprosy Control Center, which began to function about a year ago, has a project to construct a colony with a capacity of 200 patients on a 55-hectare piece of land 37 kilometers from the capital.

Venezuela.—Under the Division of Leprosy there are 23 regional services which, with their 203 urban and rural dispensaries, have the functions of investigating the prevalence of the disease by means of epidemiologic surveys, treatment of the patients, protection of the contacts, health education, and social service. Twelve of these regional services also have, within the areas of their activities, the task of BCG vaccination of the masses, with yearly vaccination for 4 consecutive years of children under 15 years of age.

Special attention is given the contacts, of whom there are 26,760, followed-up every 6 months. Their protection is effected by means of BCG vaccination of those who are Mitsuda negative or weakly positive, regardless of the results of the Mantoux test. The number of vaccinations given a contact depends upon the change in the Mitsuda reactivity. If, after four vaccinations, the Mitsuda reaction is still negative —a rare occurrence—the contact is considered as a patient in the incubation or latent stage and is subjected to preventive sulfone treatment.

The epidemiologic surveys have led to the finding of the majority of the 10,405 known active cases of leprosy—which figure gives a general

prevalence rate for the country of 1.64 per 1,000. Of that total 8,551, or 82 per cent, are under treatment—7,723 at the dispensaries, and 828 in the leprosaria. The type distribution of 8,851 cases is, in percentages: indeterminate, 31.3; tuberculoid, 28.3; lepromatous, 36.9; and borderline, 3.7.

The two existing leprosaria, Cabo Blanco and Providencia, have a total capacity of 1,000 patients, with 828 present. These are to be replaced by a new Central Antileprosy Sanitarium, of 1,000-bed capacity, soon to be built in the state of Aragua, approximately 1,000 meters above the sea level and about 52 kilometers from the capital. This sanitarium will include an institute for scientific investigation.