

## NATIONAL LEPROSY SERVICE IN BOLIVIA

by

JORGE SUAREZ, M.D.

*Chief of the Leprosy Service*

The campaign against leprosy in Bolivia began in 1942 when, by government decree, the National Leprosy Service was created under the direction of a specialist in leprosy and under the supervision of the Department of Health and Hygiene.

In the four years since its creation, the service has developed a strong program, planned to control this endemic disease in the widest sense and in the shortest time, taking into account the urgent health needs of the different districts of the Republic.

The work already accomplished can be divided into two parts. The first is the census of leprosy patients and the epidemiological study of the disease. The second is the building of sanatoria and of the National Colony, rural in type, with the resulting isolation of patients.

### LEPROSY CENSUS

This work is of basic importance in determining the prevalence of leprosy in a given area and has been done 3 times. A total of 220 patients and 736 contacts have been registered in 89 different foci. Dispensaries were organized in the more heavily infected zones and 46 new patients found in 10 new foci.

Clinical and epidemiological cards are filled out for all patients recording personal data, results of examinations and of diagnostic procedures. Anatomical graphs are used to show the location of all lesions. A photograph of each patient is attached to his card. As complete a history as possible is obtained for each patient. These data permit classification of cases according to type and stage of disease.

As the first step in the census, an enumeration was made of all the people in an area by skilled persons. Then all the individuals in the area were examined by physicians trained in leprology. These two steps have made it possible to determine the prevalence of leprosy in the total population and in specific areas and groups.

During the census, the personnel in charge were instructed to:

- (a) Contact the local authorities to enlist their cooperation and obtain information relative to the environment

- (b) Consult with the medical society and individual physicians to obtain information relative to diagnosed or suspected cases of leprosy
- (c) Canvass the local drug-stores, seeking information relative to sales of medications used in leprosy or in dermatoses which might be confused with leprosy, to get clues of patients or suspects
- (d) Interview influential persons, or persons with a good knowledge of the area, to obtain data as to persons having skin lesions which might be leprosy
- (e) Search the records of deaths, to discover evidence of preexistent leprosy and so locate relatives of such decedents for examination
- (f) Examine hospital and other medical service records for possible clues to cases.

The personnel of the census as well as the examining specialists recognized that patients must be looked for everywhere and all contacts examined. Information was sought regarding patients who had died years previously since this facilitated the discovery of past contacts. It also aided in the retrospective study of the spread of the disease.

The census was taken as completely and as rapidly as possible and without previous preparation. Cooperation of the police was not sought as polite persuasion was considered preferable. During the census, epidemiological and clinical cards were filled out as completely and rapidly as possible, including residence, giving department, province, county, and other pertinent data.

After examination of the patients, special examinations were made of all contacts, non-relatives as well as relatives. Records were kept of all such examinations.

In the various foci, special examinations were performed on the majority of the population, and epidemiological investigations were made in the community when the prevalence of the disease was high.

Each of the 99 foci has been classified according to the form of the disease prevalent in the focus as follows:

Active foci	78 per cent
Stationary foci	15 " "
Inactive foci	7 " "

To understand the distribution of the foci, it is necessary to know the geography of the Republic. Bolivia is divided into 3

regions: (a) The Andean plateau; (b) The central valley; and (c) The eastern plains.

The Andean plateau covers the western part of the country, with an average altitude of 4,000 meters (12,000 feet) above sea level. It is a cold dry region in which the prevailing winds come from the mountains. The rainfall is limited. The average temperature in winter is  $-15^{\circ}$  C. (about  $5^{\circ}$  F.), and in summer,  $20^{\circ}$  C. (about  $68^{\circ}$  F.). The flora is scarce, and the fauna consists of the vicuna whose hide is highly valued, the alpaca and the llama. The hydrography is very interesting. There is a large lake, TITICACA, two-thirds of which belongs to Bolivia and the remainder to Peru, with extensive navigation between the ports of the two countries. From this lake the river DESAGUADERO flows, crossing the tableland towards the south and ending in a smaller lake, POOPO. The Andean plateau is heavily populated and the principal cities of the country are located here, chiefly near the wellknown and inexhaustible mines of tin, wolfram, etc.

The central valley, located between the western plateau and the eastern plains, has an average altitude of 2,500 meters (7,500 feet), with a mild climate and suitable for agriculture. The fauna is more varied than in the Andean plateau. This region is characterized by the origin of several rivers which cross the plains and belong to basins of the Amazon or Rio de la Plata rivers. The population is larger than in the plateau and the cities are as important as those of the Andean plateau.

The eastern plains, the third region, is a wide tropical zone, which includes 75 per cent of the area of the country. The altitude varies from 200 meters to 500 meters (600 to 1,500 feet). The weather is warm and humid with considerable rainfall. The flora and fauna are varied and abundant. Certain regions are covered with forests, and, in some, the forest is impenetrable. There are many fine woods. The oil wells, located near the Brazilian and Argentine borders, are the source of most of the wealth. The large rivers are suitable for navigation. The population is sparse, although the oil fields are bringing rapid progress to the small cities located in the region.

After this brief description of the geography it is easy to understand the distribution of the foci and the prevalence of leprosy, which is different in each of the regions described because of the difference in environmental characteristics.

The prevalence of the disease in the Andean plateau is low and very few cases are known. There is a single unimportant focus on the shores of Lake Titicaca. No other foci are known.

In the temperate regions of the central valley, the prevalence is very high; the major part of the foci are active, and there are many open cases. Almost all are new foci located in rural areas and heavily infected. Finally, in the eastern plains the disease reaches its maximum. The foci are old and, therefore, the disease is highly prevalent; some of the foci are decreasing, but a high proportion are active. Here also there is a predominance of open cases.

The cases are classified according to type in table 1.

TABLE 1. Classification of 236\* cases of leprosy according to type.

Lepromatous		Neural		Mixed					
L <sub>1</sub>	68	N <sub>1</sub>	18	L <sub>1</sub> N <sub>1</sub>	13	L <sub>2</sub> N <sub>1</sub>	2	L <sub>3</sub> N <sub>1</sub>	4
L <sub>2</sub>	42	N <sub>2</sub>	12	L <sub>1</sub> N <sub>2</sub>	9	L <sub>2</sub> N <sub>2</sub>	7	L <sub>3</sub> N <sub>2</sub>	2
L <sub>3</sub>	30	N <sub>3</sub>	10	L <sub>1</sub> N <sub>3</sub>	12	L <sub>2</sub> N <sub>3</sub>	3	L <sub>3</sub> N <sub>3</sub>	1
Total	140		40						53

Of all the cases, 53 per cent are indigenous to the country, 12 per cent imported, and the balance unknown. The majority of the cases, 92 per cent, occur in the Indian population, only 2 per cent are found among white persons, with 6 per cent in the mixed population.

The age and sex distribution for 217 cases is given in table 2.

TABLE 2. Age and sex distribution of 217 cases of leprosy.

Years of age	Male	Female	Total
0-4	0	1	1
5-9	8	2	10
10-14	13	4	17
15-19	45	8	53
20-29	65	3	68
30-39	33	4	37
40-49	15	3	18
50-59	10	3	13
60 and over	0	0	0
Total	189	28	217

Since the disease is highest in the rural areas, there is a high prevalence among the farming population.

Using the rule proposed by Denney, and counting the total population of Bolivia as about 3 million, the actual prevalence may be estimated to be about 0.5 per 1000 population. The three most important leprogenic indices are as follows:

Index of typical cases	87.5 per cent
Index of unknown cases	14.5 per cent
Index of contact	{ household 23 per cent
	{ non-household 77 per cent

It is important to determine the prevalence rate for the entire country and for each of the provinces based on the number of cases so far discovered. These are given in table 3. In reality,

\* Three cases of tuberculoid leprosy are omitted from the table.

the rates are somewhat higher in all provinces, since new cases are being discovered continually. Further studies are necessary to determine the true prevalence. As stated previously, the provinces located in the tropical zone and the central valley have the highest rates. The provinces of La Paz, Potosi, and Oruro, in the Andean plateau have a very low prevalence.

TABLE 3. *Prevalence rate for leprosy in Bolivia and in each of the nine provinces.*

Province	Population	No. of cases	Prevalence rate cases per 100,000
La Paz	800,000	5	0.6
Cochabamba	600,000	37	6.1
Potosi	500,000	1	0.2
Oruro	400,000	2	0.5
Santa Cruz	400,000	84	21.0
Chuquisaca	300,000	42	14.0
Tarija	200,000	46	23.0
Beni	100,000	45	45.0
Pando	50,000	4	0.8
Total	3,350,000	266	8.8

At the present time, a modern colony of rural type is being built with accommodations for 300 or 400 patients, in Los Negros, in the central part of Bolivia, near the central network of communications of the country. It has an area of 1,300 hectares (about 3,250 acres) of arable land, and is on the bank of an important river which does not flow into populated areas beyond the colony. The paved highway from Santa Cruz to Cochabamba is two kilometers ( $1\frac{1}{4}$  miles) away. All the patients may be perfectly isolated, and transportation and communication facilities with this region are good.

There are three small leprosaria in the cities of Sucre, Trinidad, and Baures which at the present time are giving valuable services while the National Colony is built.

Four dispensaries in the different regions, perform essential functions in health education, control, supervision, and treatment of the patients, as well as epidemiological research in the different parts of the country.