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A NOTE ON LEPROSY IN PUERTO RICO*

JAMES A. DOULL, E. MARTINEZ RIVERA, GEORGE M. SAUNDERS,
RICARDO S. GUINTO, and E. GARRIDO MORALES**

1. HISTORICAL SKETCH

The date and manner of introduction of leprosy into Puerto Rico are unknown. It is usually considered to have been imported from Africa in the early days of the slave traffic. In a book by Fray Iñigo Abad y Lasierra, published in 1788, entitled "Historia, Geografía, Civil y Natural de la Isla de San Juan de Puerto Rico," the following statements appear: "Mal de San Lázaro, o sea la elefantiasis de los griegos, ha desaparecido de los pueblos de Europa situados entre los 40° y 55° de latitud: los casos que allí se observan son importados de los demás puntos del globo. Deseamos a Puerto Rico igual beneficio: pero por ahora nos es doloroso hacer constar que es enfermedad muy generalizada."¹

Institutional care: The disease was looked upon with indifference until about 1870 when the provincial diputation recommended establishment of a leprosarium. Nothing came of this effort nor of an attempt made about the same time to require each municipality to isolate and care for its own patients. Ten years later (in 1880) San Juan built a "hospital" in the rear of the jail with accommodations for six patients. A larger building was later built on the same site. In 1895 or 1896 the provincial diputation made a renewed attempt to have an insular institution established. A site was selected about 10 miles east of San Juan but complications arose and the project was abandoned.

When a Board of Health for San Juan was established by Governor Henry in February, 1899, this "hospital," in very dilapidated condition and housing only two patients, came under its jurisdic-

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** The authors are, respectively, Professor of Hygiene and Public Health in the School of Medicine of Western Reserve University at Cleveland, Ohio; Assistant Director of the Division of Health Units, Department of Health of Puerto Rico; Epidemiologist, and Junior Epidemiologist, American Leprosy Foundation (Leonard Wood Fund) New York, and Commissioner of Health of Puerto Rico.

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tion. The sum of one hundred dollars was secured from the military government and the building was repaired and converted into an insular institution. A search was made in San Juan in the following May with the result that 11 patients were found and segregated. In April, 1900, there were 18 patients in segregation.

About a year later the patients were transferred to the buildings formerly occupied by the Quarantine Station on Cabras Island. On June 30th, 1902, there were 17 patients, 10 males and 7 females, isolated on this island. No records could be found for the intervening years but on June 30th, 1909, there were 21 patients in the institution. The number increased annually to 39 in 1914 and remained at this level, more or less, for the next twelve years. On June 29th, 1926, 43 patients were transferred to the new Insular Leprocomio at Trujillo Alto. The new institution has usually maintained a patient population of between fifty and sixty since 1926. Recently, however, there has been a reduction, the number, as of June 30th, 1940, being 45.

Recorded mortality among cases: Since 1932 the death certificates for all municipalities of the Island have been filed in the Bureau of Vital Statistics and Epidemiology of the Department of Health. Local registration of deaths was required long before the American occupation, but the records made before 1912 are considered too inadequate and incomplete for the present purpose. Fortunately it has long been the usual practice to enter "leprosy" as the primary cause of death whenever the deceased is known to have been a leper. The Commissioner of Health therefore requested the local registrars to examine all death certificates filed between January 1st, 1912, and December 31st, 1931, and to send him certain specified facts if "leprosy" had been entered as the primary or a contributory cause of death. For the period January 1st, 1932, to December 31st, 1939, the requisite data were furnished by the Bureau. It may be noted that deaths which occurred on Cabras Island were registered at San Juan and that those which occurred at the new Leprocomio were registered at Trujillo Alto.

Doubtless the registration of deaths has been more accurate and complete in recent years than formerly. The average annual rates which are given in Table I should therefore be interpreted with caution. It may be added that the median age at death as estimated from the ages given on the certificates was approximately 40 years. One death was reported in a female under 10 years* and one in a male over 80 years of age. The ratio of males to females recorded as dying from leprosy during the period was 1.6 to one.

* Subsequent investigation has established the fact that the cause of death in this case was not leprosy.

T A B L E I
 PUERTO RICO: DEATHS AND ANNUAL DEATH RATES FROM LEPROSY, FOR
 PERIODS OF YEARS
 1912-1939

Period	Average annual population	Deaths from leprosy	Ave. annual death rate per 100,000
1912-14	1,178,091	6 (3 years)	0.2
1915-19	1,252,994	21 (5 years)	0.3
1920-24	1,359,347	14 (5 years)	0.2
1925-29	1,478,422	17 (5 years)	0.2
1930-34	1,615,233	24 (5 years)	0.3
1935-39	1,776,774	39 (5 years)	0.4

Places of birth of decedents: Thirty-seven of the 77 municipalities of the Island were included on the certificates as places of birth of persons recorded as dying from leprosy. San Juan with 7.4 per cent of the total population of Puerto Rico (in 1930) was recorded as the birth place on 13.0 per cent of the certificates. Ponce with 5.7 per cent of the population was recorded on 12.3 per cent. Judging from death certificates the chance of dying from leprosy was roughly about twice as great for persons born in these cities as for the inhabitants of the Island as a whole. The relative mortality of certain rural municipalities was far more conspicuous. The municipalities of Naguabo, Patillas and Vega Baja, with a combined population of only 3.4 per cent of that of the Island, were recorded as places of birth on 32.6 per cent of the certificates, or on about ten times as many as would be expected. These are of course very crude calculations and it should be remembered also that leprosy is not necessarily contracted at the place of birth.

Notified cases: 1928-1939: During the past twelve years, 131 cases of leprosy have been reported from 24 municipalities of the Island. The number notified each year from each of these municipalities is shown in Table II.

The notifications from Trujillo Alto may be questioned, and investigation is now under way to determine the correct places of residence of cases reported from this municipality. Omitting these there are 110 whose places of residence are known. Of the total, San Juan contributed 21 per cent, Ponce, 12 per cent, and Naguabo, Patillas and Vega Baja, combined, 21 per cent. Again there appears a notable concentration in these three last mentioned municipalities. Also Aguadilla, Arecibo and Mayagüez, the combined population of which was about 10 per cent of the total population of the Island in 1930, contributed approximately 20 per cent of the total cases notified in the twelve years period.

T A B L E II
 REPORTED CASES OF LEPROSY BY MUNICIPALITY AND BY CALENDAR YEAR
 FROM 1928 TO 1939 (INCLUSIVE)

TOWN	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	Total
1. Adjuntas	0	0	0	0	0	0	0	1	0	0	0	0	1
2. Aguadilla	1	1	2	0	0	2	0	0	0	0	0	2	8
3. Arecibo	0	1	0	0	1	1	1	0	0	2	1	0	7
4. Arroyo	0	1	0	0	0	0	0	0	0	0	1	0	2
5. Bayamón	0	0	1	0	0	0	0	0	0	0	0	0	1
6. Cabo Rojo	0	0	0	0	0	0	1	0	0	0	0	0	1
7. Caguas	0	0	0	0	0	0	1	0	0	0	0	0	1
8. Carolina	0	0	0	0	0	0	0	0	0	1	0	0	1
9. Fajardo	0	0	0	0	0	0	1	0	0	0	0	0	1
10. Guánica	0	0	0	0	0	0	0	0	0	1	0	0	1
11. Guayama	0	0	0	0	0	0	0	0	0	1	0	1	2
12. Guaynabo	0	0	0	0	0	1	0	0	0	0	0	0	1
13. Humacao	0	0	1	1	0	0	0	0	0	0	0	1	3
14. Juncos	0	0	0	0	2	0	1	0	0	0	0	0	3
15. Lares	0	1	0	0	0	0	0	0	0	0	0	0	1
16. Mayagüez	1	0	1	0	0	0	1	1	0	2	0	0	6
17. Naguabo	2	0	0	2	0	0	0	1	2	0	1	0	8
18. Patillas	0	0	0	0	3	0	1	1	0	0	0	0	5
19. Ponce	1	0	1	1	0	3	2	0	1	2	1	1	13
20. Río Piedras	0	0	0	0	1	4	0	0	0	2	0	3	10
21. San Juan	0	2	3	1	6	2	2	1	2	2	0	2	23
22. San Lorenzo	0	0	0	0	0	1	0	0	0	0	0	0	1
23. Trujillo Alto	1	0	1	2	6	1	1	4	2	0	0	3	21
24. Vega Baja	0	0	0	0	3	4	1	1	1	0	0	0	10
TOTALS	6	6	10	7	22	19	13	10	8	13	4	13	131

No cases reported from the 53 following towns: Aguada, Aguas Buenas, Aibonito, Añasco, Barceloneta, Barranquitas, Camuy, Cataño, Cayey, Ceiba, Ciales, Cidra, Coamo, Comerio, Corozal, Culebras, Dorado, Guayanilla, Gurabo, Hatillo, Hormigueros, Isabela, Jayuya, Juana Díaz, Lajas, Las Marías, Las Piedras, Loíza, Luquillo, Manatí, Maricao, Maunabo, Moca, Morovis, Naranjito, Orocovi, Peñuelas, Quebradillas, Rincón, Río Grande, Sabana Grande, Salinas, San Germán, San Sebastián, Santa Isabel, Toa Alta, Toa Baja, Utuado, Vega Alta, Vieques, Villalba, Yabucoa, Yauco.

Study by Palacios in 1927: Between December, 1926, and August, 1927, a field study of leprosy in Puerto Rico was carried out by Palacios². At the time of this survey there were 58 patients at the Insular Leprocomio, 40 males and 18 females. Twenty-seven of these were listed as having the "nodular" type, 21 the "anesthetic" type and 10 the "mixed" type. An additional 42 cases were registered at the Department of Health. By diligent search, Palacios succeeded in raising the total of known cases to 137. Those which he discovered were chiefly of the "macular anesthetic" type.

Palacios was of opinion that the indicated prevalence rate of about 10 per 100,000 was far too low and that a conservative estimate of the total number of cases was 300, or about 20 per 100,000. He commented on the long duration of the disease and estimated that a known prevalence rate of 10 per 100,000 could be maintained in Puerto Rico by the discovery of only a half dozen new cases each year. He made an interesting speculation also on the low infectivity necessary to maintain the existing prevalence rate. "Assuming for each patient an average span of life of 40 years, to maintain the existing rate, a hundred lepers would need to infect only 2.5 persons per year."*

The municipalities with the highest prevalence rates were found by Palacios to be Naguabo, with 1.20 per 1000; Patillas with 0.98 per 1000; Vega Baja with 0.68 per 1000; and Arroyo, with 0.55 per 1000. The municipality with the largest number of cases was San Juan, which had 25. Palacios emphasized the "apparent immunity to leprosy on the part of the interior hill country..."

In 20 per cent of the total Palacios elicited a previous history of the disease in the family and he submitted several charts illustrating the occurrence of multiple cases.

II. KNOWN PREVALENCE: 1940

On June 30th, 1931, there were 58 patients in the Insular Leprocomio and one year later the same number. Assuming this to be the correct number for January 1st, 1932, the minimum number of cases as of January 1st, 1940, should be 102, calculated as follows:

1. Remaining in Leprocomio, Dec. 31, 1931.....	58	
2. New cases reported, Jan. 1st, 1932, to Dec. 31st, 1939	102	160
3. Registered deaths, Jan. 1st, 1932, to Dec. 31st, 1939		58
4. Remaining, Dec. 31st, 1939.....		102

Excepting for patients who had been treated in the Leprocomio, or who had died, the names and addresses of persons reported to have had leprosy prior to 1937 were not available at the Department of Health, the earlier records having been destroyed by fire. The Commissioner of Health therefore asked each health officer to submit the names of all cases which had come to his attention since the establishment of his health unit. As a result of this cooperative effort a number of cases were relocated. Certain of those reported as having had leprosy are believed to have died and to have been

* This estimate should be based on the average duration of life after onset of leprosy. This is probably less than 20 years in Puerto Rico.

certified as dying from some other cause, quite correctly in all probability, with no reference to leprosy on the certificates. On July 1st, 1940, the names of 83 living cases were known. The places of residence of these persons on that date were as follows:

At the Insular Leprocomio	45	
At home on parole or isolated at home	32	
Absconders	3	
Awaiting segregation	3	83

The known living cases of July 1st, 1940, are classified by age and sex in Table III.

T A B L E III
PRESENT AGES OF LIVING PATIENTS
(as of July 1st, 1940)

Age Groups	At Leprosarium			Out of Leprosarium			Grand Total
	Males	Females	Total	Males	Females	Total	
10 - 19	5	1	6	1	1	2	8
20 - 29	5	3	8	4	2	6	14
30 - 39	9	2	11	1	2	3	14
40 - 49	6	2	8	5	4	9	17
50 - 59	1	1	2	1	2	3	5
60 - 69	4	2	6	0	1	1	7
70 - 79	2	0	2	1	1	2	4
80	0	1	1	1	0	1	2
Unknown	0	2	2	5	5	10	12
Totals	32	14	46	19	18	37	83

Clinical types represented at the Leprocomio: On September 15th, 1940, there were in the Leprocomio 47 patients, two new cases and one formerly isolated at home having been admitted since July 1st, 1940, and one having been paroled. Of these, 18 were classified as cutaneous, 15 as neural and 14 as mixed cutaneous and neural. Almost all the cases were far advanced and eight, or 17 per cent, were noted as having serious eye lesions.

III. PHYSICAL EXAMINATION OF HOUSEHOLD ASSOCIATES AND SCHOOL CHILDREN IN AREAS OF HIGHEST PREVALENCE

With the assistance of Drs. Ramón A. Ríos, Hilton López, J. R. Villamil and D. J. M. Santiago, health officers respectively of the municipalities of Naguabo, Patillas, Ponce and Vega Baja, more than two thousand persons were examined during September, 1940. In the examination of males the entire skin surface was inspected, and in females all the surface save the pubic region.

Of the total examined 1873 were school children, 1288 being males and 585 females, chiefly from 7 to 14 years of age. Of these

children, 890 were in public schools of Naguabo, including schools in barrios considered most highly infected with leprosy; 280 in public schools of Patillas; 446 in public schools of Ponce, and 257 in public schools of Vega Baja. None of these children was found to have leprosy, although a careful search was made for early macules. Thirty-four additional miscellaneous persons, children and adults, were examined at the Health Center in Naguabo, likewise with negative results.

In all municipalities 105 household associates of known leprosy cases were examined. Among these persons one neural case was discovered.

Several persons suspected by physicians to have leprosy were examined. In Ponce two of these proved to be far advanced cases, one cutaneous, the other neural. In Naguabo, four were found. One of these, a child of twelve, had far advanced cutaneous lesions, the others were moderately or far advanced neural cases.

IV. CONCLUSIONS

1. From the investigations so far made it is not possible to state the prevalence of leprosy in Puerto Rico with accuracy. It is certain that more than one hundred cases exist and that for the most part these persons are in advanced stages of the disease. From general knowledge of the disease it is fair to assume that there are at least as many unrecognized cases. If so the prevalence rate would be about 11 per 100,000 of the population. This is a low rate in comparison, for example, with the Philippines where the estimated prevalence is about ten times as high.

2. Even less can be said with assurance regarding the trend of the disease. The recorded death rate indicates rather a static condition but such an index is unreliable. The reported cases in recent years have averaged about eleven per year.

3. The disease is widespread over the island with a predilection for the sea coast municipalities. Naguabo, Patillas and Vega Baja have been focal centers and apparently this is still true. San Juan and Ponce are centers of higher than average prevalence.

4. Physical examination of 1873 school children in Naguabo, Patillas, Ponce and Vega Baja revealed no cases of leprosy. It should be noted, however, that a considerable proportion of children are not attending school and that those who were examined may not be representative of the child population of the respective municipalities. Among 105 family associates of known cases one neural case was found. Two cases were discovered in Ponce and four in Naguabo among suspects sent for examination by physicians. Two of these were of the advanced cutaneous type and four were classified as neural.

As a step towards more adequate knowledge of the prevalence of leprosy in Puerto Rico, it is recommended that all the inhabitants of certain districts should be given a physical examination.

These districts should include certain barrios in Naguabo, Patillas, Vega Baja, Ponce and San Juan.

There should also be initiated a current and thorough investigation of each case. Although prevalence may be much higher than we have indicated, nevertheless the disease is *thin* in occurrence. Furthermore migration of the inhabitants of the Island usually can be traced. An exceptional opportunity is thus created to add materially to knowledge of the epidemiology of leprosy.

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