

Leprosy in the United States, 1967-76

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A LEPROSY CONTROL PROGRAM consisting mainly of the surveillance of the contacts of persons in the United States with leprosy apparently has been reasonably successful in achieving its goal of expeditious treatment for those few contacts who become infected. Cases in the U.S. native-born have decreased; in the foreign-born, however, they have increased. In this paper, we explore the implications and significance of the increased number of cases in the foreign-born and compare the data on leprosy for 1967-76 with those for 1947-68 (1). The staffs of the Leprosy Register and the Clinical Branch of the Public Health Service Hospital at Carville, La., conduct the control program.

Methods and Materials

The 50 States reported 1,432 cases of leprosy during the period 1967-76. This number includes the cases of persons admitted to the Carville Hospital. A low of 102 cases was reported in 1967 and a high of 188 in 1976 (table 1). The average number per year was 144.

Although the 1,432 cases in table 1 were reported to Carville for the first time in the year shown, not all had been newly diagnosed in that year. Some had been diagnosed earlier elsewhere and for various reasons, had not been reported in the United States

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until the year in question. The majority of these previously unreported cases involved aliens who had been admitted to the United States with known disease. Thirty-three percent of the cases reported from Carville, for example, fell into this category. In addition, 49 patients were admitted to the United States from foreign countries solely to obtain treatment at Carville for their disease and deformities. Seven percent of the new admissions to Carville were of native-born Americans whose cases had been previously diagnosed but had not been reported until they entered this hospital. This same delay in reporting has been noted in an earlier review of leprosy statistics for the United States (1). However, since the lag in reporting seems to be consistent from year to year and there is no duplication of cases, we cite only the

Table 1. Cases of leprosy in the United States, 1967-76

Year	Carville admissions	Reported in continental United States	Reported in Hawaii ¹	Total
1967	44	45	13	102
1968	37	66	20	123
1969	39	71	8	118
1970	36	70	16	122
1971	45	75	27	147
1972	47	89	42	178
1973	42	102	36	180
1974	39	40	28	107
1975	53	88	26	167
1976	49	109	30	188
Total	431	755	246	1,432

¹ SOURCE: Center for Disease Control, Public Health Service, Atlanta, Ga.

year the case was reported to Carville. We do not have complete data on all the cases reported from outside Carville, especially those reported from Hawaii, on which information was obtained from the Center for Disease Control, Public Health Service.

A known suspected diagnosis of leprosy is the only qualification for admission to the Carville Hospital. Anyone who has leprosy and comes to the hospital requesting care for his illness will be admitted. This liberal admission policy applies not only to native-born Americans but also to all aliens, (including those who possess a temporary visa to work or attend school), military personnel of foreign countries on assignment to the United States for training, and aliens who have entered the country illegally. Any alien may be hospitalized for treatment, because treatment is considered to be a control measure instituted to decrease or eliminate any hazard that these aliens may present to the U.S. public health.

Results

Of the total 1,432 cases reported in 1967-76 by the 50 States, including cases of persons admitted to the Carville hospital, 801 were in males and 631 in females, a ratio of 1.3 to 1. Of these persons, 189 (13.2 percent) were 61-90 years old; 995 (60 percent) 21-60; and 166 (11.5 percent) under 20; of those under 20, there were 24 (1.6 percent) who were less than 10 (table 2). The ages of 82 (5.7 percent) with reported cases were unknown.

Classification of disease. The multi-bacillary type of the disease (lepromatous and dimorphous) was re-

ported in 958 cases (66.9 percent) and the pauci-bacillary type (tuberculoid and indeterminate) in 433 cases (30.2 percent); 41 cases (2.8 percent) were unclassified (table 3).

History of contact. Only 306 (25.8 percent) of the persons whose cases were reported in the continental United States and in whom leprosy was diagnosed had any known contacts who had leprosy, and for 260 (84.9) of these, the contact was a member of the family. Information was not available on the contacts of the patients reported from Hawaii.

Cases in native-born versus foreign-born. A majority (1,089 or 76 percent) of the leprosy cases reported

Table 2. Age distribution of patients with leprosy in the United States, 1967-76

Age range (years)	Carville admissions	Cases reported in continental United States	Cases reported in Hawaii ¹	Total cases
1-10	4	15	5	24
11-20	37	76	29	142
21-30	77	204	60	341
31-40	66	154	41	261
41-50	90	97	29	216
51-60	77	69	31	177
61-70	54	56	19	129
71-80	23	26	4	53
81-90	3	3	1	7
Unknown ²	0	55	27	82
Total	431	755	246	1,432

¹ SOURCE: Center for Disease Control, Public Health Service, Atlanta, Ga.

² In estimating average age, cases in which patient's age was unknown were excluded.

in the United States were in the foreign-born (table 4). The foreign-born patients came from 40 countries; (the American Commonwealth and Territories, whose natives are considered foreign-born, are included in this count). At the time the cases were reported, 68 patients were naturalized U.S. citizens, 153 were natives of the American Commonwealth and Territories, 601 were known aliens, and the citizenship status of the remaining 267 was unknown. If we presume that these 267 were also aliens, the total number of cases in aliens would be 868, or 79.7 percent of all cases in the foreign-born. The following areas were the source of six or more cases:

<i>Country</i>	<i>Cases</i>
Mexico	295
Philippines	246
American Samoa	105
Cuba	66
West Indies	57
Vietnam	46
South America	41
Puerto Rico	39
China	24
India	18
Thailand	14
Cambodia	8
Western Samoa	7
Burma	6
26 known countries	58
Unknown countries	59
Total	1,089

Mexico contributed the greatest number of the cases reported among the foreign-born—295, or 27

Table 3. Classification of disease involved in cases of leprosy reported in the United States, 1967–76

<i>Type of disease</i>	<i>Carville admissions</i>	<i>Cases reported in continental United States</i>	<i>Cases reported in Hawaii¹</i>	<i>Total cases</i>
Lepromatous	273	366	80	719
Dimorphous	104	107	28	239
Tuberculoid	46	202	107	355
Indeterminate	8	39	31	78
Unknown	0	41	0	41
Total	431	755	246	1,432

¹ SOURCE: Center for Disease Control, Public Health Service, Atlanta, Ga.

percent of the total. The second largest group—246 cases, or 22.6 percent—were reported in natives of the Philippine Islands. Thus, approximately 541 (or 49.7 percent) of the foreign-born patients came from these two countries. The four American Territories and the American Commonwealth were the source of 153 cases (14 percent): 105 of these patients were from American Samoa, 39 from Puerto Rico, 5 from Guam, and 4 from the Virgin Islands.

Refugees admitted by special acts of the U.S. Congress accounted for 140 cases. Sixty-six refugees were from Cuba, 6 from Burma, 8 from Cambodia, 14 from Thailand, and 46 from Vietnam.

Although native-born patients (343) were reported from 30 of the 50 States, the majority of cases, both in the native-born and the foreign-born, were re-

Table 4. Sources of leprosy cases reported in the United States in U.S. native-born and foreign-born, 1967–76

<i>Year</i>	<i>U.S. native-born</i>			<i>Foreign-born</i>			<i>Total cases</i>
	<i>Carville admissions</i>	<i>Reported in continental United States</i>	<i>Reported in Hawaii¹</i>	<i>Carville admissions</i>	<i>Reported in continental United States</i>	<i>Reported in Hawaii¹</i>	
1967	23	10	4	21	35	9	102
1968	18	15	5	19	51	15	123
1969	16	18	4	23	53	4	118
1970	18	11	1	18	59	15	122
1971	18	9	6	27	66	21	147
1972	25	14	8	22	75	34	178
1973	14	15	6	28	87	30	180
1974	20	4	3	19	36	25	107
1975	24	4	3	29	84	23	167
1976	13	10	4	36	99	26	188
Total	189	110	44	242	645	202	1,432

¹ SOURCE: Center for Disease Control, Public Health Service, Atlanta, Ga.

ported from six States—California, Florida, Hawaii, Louisiana, New York, and Texas. These States were the sources of 298 (87 percent) of the native-born cases and 855 (78.5 percent) of the foreign-born, or 1,153 (80.5 percent) of all cases reported for the period 1967–76 (table 5).

During 1967–76, there were 246 cases reported from Hawaii: 202 (82 percent) of them were in the foreign-born and 44 (17.9 percent) in the native-born. Of the native-born patients, 42 were born in Hawaii, 1 in California, and 1 in Pennsylvania.

Twenty-six of California's 48 counties reported 424 of the total 1,432 U.S. cases, and 222 (52.4 percent) of the California cases were reported from Los Angeles County (table 6). As table 6 shows, the overwhelming majority of these cases (91 percent) were in the foreign-born, and as might be expected, most occurred in the major population areas of the State.

Table 5. Leprosy cases in U.S. native-born and foreign-born in 6 States reporting majority of U.S. cases, 1967–76

State	U.S. native-born	Foreign-born	Total cases
California	38	386	424
Texas	176	91	267
Hawaii	44	202	246
New York	0	134	134
Florida	6	38	44
Louisiana	34	4	38
Total	298	855	1,153

Table 6. Distribution of leprosy cases in California in natives of the State, other U.S. natives, and the foreign-born, by county, 1967–76

County	California natives	Other U.S. natives	Foreign-born	Total cases
Alameda	0	1	12	13
Fresno	0	1	6	7
Kern	0	3	6	9
Los Angeles	8	11	203	222
Orange	0	1	19	20
San Diego	1	1	40	42
San Francisco	1	1	38	40
San Mateo	0	0	7	7
Santa Clara	0	0	8	8
Tulare	2	1	8	11
Ventura	0	1	9	10
15 remaining counties	1	4	30	35
Total	13	25	386	424

Of the 267 cases reported from Texas, 176 were in natives of the United States, of whom 152 had been born in Texas. The majority of the foreign-born whose cases were reported from this State came from Mexico (table 7).

Four foci of the disease are apparent in Texas. The first of these, in the southern tip of the State in the Rio Grande Valley, includes Starr County (14 cases), Hidalgo County (23 cases), and Cameron County (16 cases). These three counties had 19.8 percent of the Texas cases.

The second focus of the infection in Texas is the area around Corpus Christi, comprised of Bee County (8 cases), Refugio County (9 cases), San Patricio County (5 cases), and Nueces County (26 cases). These 4 counties had 48 cases (18 percent of the Texas total).

The third focus is along the northern seacoast and is comprised of Harris, Galveston, and Jefferson Counties; they contributed 33 (12.4 percent) of the total Texas cases. The four seaports in this area (Houston, Galveston, Beaumont, and Port Arthur) have a total population of approximately one and one-half million. The fourth focus is the San Antonio area, which contributed 28 cases.

In addition, Dallas contributed seven cases and El Paso five, but these numbers are too small to qualify

Table 7. Distribution of leprosy cases in Texas in natives of State, other U.S. natives, and the foreign-born, by county, 1967–76

Foci of infection and county	Texas natives	Other U.S. natives	Foreign-born	Total cases
<i>Focus 1</i>				
Starr	8	1	5	14
Hidalgo	10	0	13	23
Cameron	6	0	10	16
<i>Focus 2</i>				
Bee	5	3	0	8
Refugio	7	0	2	9
San Patricio	2	0	3	5
Nueces	17	1	8	26
<i>Focus 3</i>				
Harris	11	3	11	25
Galveston	2	1	0	3
Jefferson	2	3	0	5
<i>Focus 4</i>				
Bexar	14	2	12	28
<i>Other foci</i>				
Dallas	2	1	4	7
El Paso	1	0	4	5
Other	65	9	19	93
Total	152	24	91	267

these cities as endemic foci of infection. The remaining Texas cases were distributed among 47 other counties throughout the State, each of which reported no more than 4 cases.

From 13 of the 64 parishes in Louisiana, 38 cases (2.7 percent of the total U.S. number) were reported. The majority were reported from the southern part of the State, which is designated "French Louisiana" because it has been inhabited by people of French descent since before the Louisiana Purchase (2). To establish the distribution of cases, one can further subdivide French Louisiana geographically into western, central, and eastern sections (table 8).

The main parishes of the western section are Calcasieu, Jefferson Davis, and Cameron. Nine cases were reported from Calcasieu and Jefferson Davis. The marshlands of this area have been used mainly for the cultivation of rice, trapping, and hunting. In recent years, however, this western section has become industrialized, and Lake Charles, a city in Calcasieu Parish, is now a major seaport.

The central section of French Louisiana, having been continuously occupied by a French population, has maintained a homogeneity lacking in the other sections, and people have retained more of their old customs than in other areas of French Louisiana. The population is rural, and its small farmlands enjoy a high agricultural productivity. The core of French Acadians here has long been considered the primary endemic focus of leprosy in the State. Yet no new cases have been reported from this section during the past 10 years.

In fact, the main focus of leprosy cases in Louisiana

is in the eastern section of French Louisiana, along the Mississippi River delta, the so-called Sugar Bowl. This area, which extends from Baton Rouge south to New Orleans, grows the greatest quantity of sugar cane in the State. Since people are attracted to the area mainly by its industry, they are more ethnically diverse than those in other parts of French Louisiana. The Carville Hospital is in Iberville Parish, midway between Baton Rouge and New Orleans.

Of the 38 cases of leprosy contributed by Louisiana, 34 were in natives of the State and 4 in the foreign-born. The majority of the cases in Louisiana thus continue to occur in persons born in the State, but the distribution appears to be changing from the central section of French Louisiana to its more ethnically diverse eastern and western sections.

Florida had 44 cases, all reported from 7 of its 67 counties and the majority (36 or 81.8 percent) reported from Dade County. Thirty-eight of the patients were foreign born, and of the 6 born in the United States, only 4 were natives of Florida (table 9).

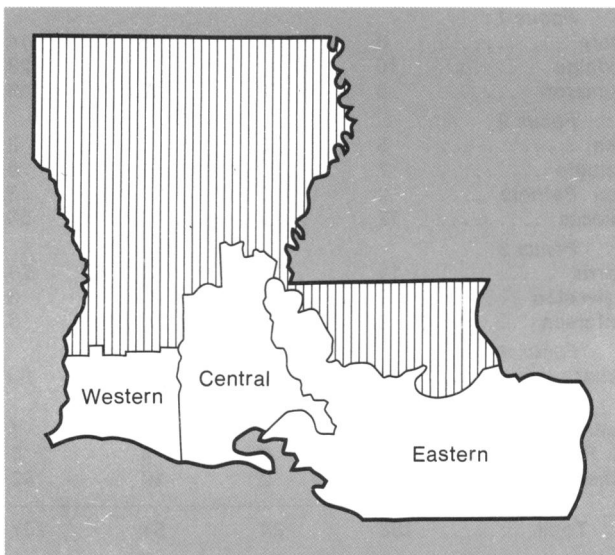
The 134 cases reported by New York State accounted for 11.6 percent of the total reported from the six States in which the disease is prevalent, and New York City accounted for all but 1 of the 134: 79 were reported from the Public Health Service Hospital, Staten Island, and 54 from the remaining boroughs of the city; 1 case was also reported from

Table 8. Distribution of leprosy cases in Louisiana in natives of State, other U.S. natives, and the foreign-born, by area of State and parish, 1967-76

Area and parish ¹	Louisiana natives	Other U.S. natives	Foreign-born	Total cases
Southwest				
Calcasieu	6	1	0	7
Jefferson Davis	2	0	0	2
Southeast				
East Baton Rouge	1	2	2	5
East Feliciana	1	0	0	1
St. James	1	0	0	1
St. John the Baptist ..	1	0	0	1
Jefferson	2	0	0	2
St. Bernard	1	0	0	1
St. Mary	1	0	0	1
Orleans	11	1	2	14
Other parishes				
DeSoto	0	1	0	1
Tangipahoa	1	0	0	1
Vernon	1	0	0	1
Total	29	5	4	38

¹ No cases were reported in the south central area during this period.

French Louisiana



Rockland County. All 134 cases were in the foreign-born. They were divided among natives of the West Indies (40), Puerto Rico (18), South America (16), the Philippine Islands (10), Cuba (7), and 10 other countries (14); the country of origin of 29 patients was unknown.

Discussion

A comparison of the 1,432 newly reported cases of leprosy in the United States for the 10-year period 1967-76 with the 1,820 cases reported for the 20-year period 1949-68 reveals an average increase annually of 52 more cases in the more recent period (1). There has been no change, however, in the sources of the majority of cases—California, Hawaii, Texas, Louisiana, Florida, and New York. In the period 1967-76, these six States reported 298 (86.8 percent) of the 343 cases in the native-born and 855 (78.5 percent) of the 1,089 cases in the foreign-born. Of the remaining States, 25 contributed 279 (19.5 percent) of the total cases, or an average of 11 cases per State. Of these 279 cases, 35 were in the native-born and 244 in the foreign-born, or an average per State of 1.4 cases in the U.S. native-born and 9.6 cases in the foreign-born.

The question arises as to why we are detecting more cases of leprosy in the foreign-born in the United States. Our review showed that the largest number of leprosy patients came from Mexico, the source of 295 (27 percent) of the cases in the foreign-born, or 20.6 percent of all cases reported in the United States in the years 1967-76. More than 40,000 immigrants have entered the United States annually from that country since 1965 (3). An increased immigration quota, complemented by temporary admissions of Mexicans with work permits, and the entry of unknown numbers of illegal aliens undoubtedly account for, if not all, certainly the majority of the

new cases reported, because once a person with leprosy enters the United States, he may go to any Public Health Service facility for care.

An increasing number of immigrants also have been admitted to the United States from other countries during the period 1967-76 as a result of the enactment of the Immigrant Act of October 3, 1965 (4). For example, admissions from Asia, particularly, have increased tenfold, especially admissions from Asian countries known to have a high prevalence of leprosy, namely the Philippine Islands (which contributed 246 of the cases among the foreign-born), China (24 cases), Cambodia (8 cases), Indonesia (5 cases), Thailand (14 cases), Burma (6 cases), India (18 cases), Korea (4 cases), and Vietnam (46 cases). These countries were the source of 371 cases or 34 percent of the cases in the foreign-born and 25.9 percent of all cases reported in the United States during the years 1967-76.

Another source of the increase in cases among the foreign-born has been Cuba, with 66 cases. This increase was incident to the large number of immigrants who were qualified under the U.S. Immigration Act of November 2, 1966, and entered the United States between that date and June 30, 1968.

From an epidemiologic standpoint, this change in the leprosy problem is a result of the increase in cases in the foreign-born. The ratio of cases in the native-born versus the foreign-born has changed from approximately 55:50 to 25:75. Thus, because of the increase in cases among the foreign-born, 52 more cases of leprosy were reported annually in the United States during the past decade as compared with the prior 20 years. This increase in cases among the foreign-born appears, in turn, to be related to a liberalization of the U.S. foreign quarantine program and of U.S. immigration laws, as well as to the large number of illegal aliens entering the United States from Mexico.

Table 9. Distribution of leprosy cases in Florida in natives of State, other U.S. natives, and the foreign-born, by county, 1967-76

County	Florida natives	Other U.S. natives	Foreign-born	Total cases
Collier	0	1	0	1
Dade	2	0	34	36
Duval	0	0	2	2
Lee	1	0	0	1
Monroe	1	0	1	2
Pinellas	0	1	0	1
Polk	0	0	1	1
Total	4	2	38	44

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