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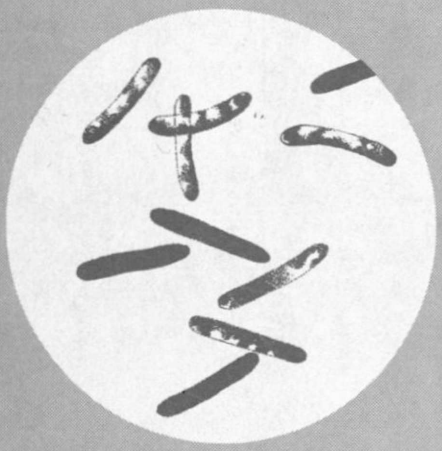
NATIONAL COMMUNICABLE DISEASE CENTER

LEPROSY

SURVEILLANCE

CONTENTS



U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE / PUBLIC HEALTH SERVICE
HEALTH SERVICES AND MENTAL HEALTH ADMINISTRATION

PREFACE

We are indebted to all state epidemiologists for the information which has made this report possible. Special recognition should go to Philip K. Condit, M.D., State Epidemiologist, Grace B. Goebel, M.D., Head, Leprosy Control Unit, James Chin, M.D., Head, General Epidemiology Section, California State Department of Health, Paul Fasal, M.D., Chief, Leprosy Service, USPHS Hospital, California; E. Charlton Prather, M.D., State Epidemiologist, Florida State Board of Health, Milton S. Saslaw, M.D., Acting Director, Dade County Health Department, Jack McKenzie, M.D., Cuban Refugee Emergency Center, Florida; Ira D. Hirschy, M.D., State Epidemiologist, Hawaii Department of Health; Charles T. Caraway, D.V.M., State Epidemiologist, Louisiana State Department of Health; Howard B. Shookhoff, M.D., Chief, Division of Tropical Diseases, City of New York Department of Health, Chung, C. Wang, M.D., Physician-in-Charge, Tropical Disease Clinic, Washington Heights Clinic, New York; Rafael Correa-Coronas, M.D., Auxiliary Secretary of Health for Preventive Medicine, Puerto Rico Department of Health, Victor Torres, M.D., Department of Dermatology, University of Puerto Rico Medical School, Puerto Rico; and M. S. Dickerson, M.D., State Epidemiologist, Texas State Department of Health.

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I. SUMMARY

There were 1,820 cases of leprosy reported in the United States, including Puerto Rico, from the years 1949 to 1968; 89 percent of the cases (1,612) were reported from seven areas: California, Florida, Hawaii, Louisiana, New York City, Texas, and Puerto Rico. The largest number of cases (147) were reported in 1968 (incidence .073/100,000). The incidence has varied over the 20-year interval, reflecting the development of specialized state programs in Texas, California, Florida, and New York, and changes in national origin of the persons involved in Florida and Hawaii. With the emphasis on outpatient treatment, subsequent to a brief period of hospitalization for initiation of therapy, more cases are being reported. In addition, cases are diagnosed after briefer periods of illness.

Of the 147 cases reported in 1968, 63 (43 percent) were born in the United States, including Puerto Rico, and 65 (43 percent) were born in the four countries of Mexico, Philippines, Cuba, and Samoa. Lepromatous and dimorphous leprosy was diagnosed in 78 (66 percent) of 118 patients whose clinical type was reported.

Only 21 percent of cases reported in California were born in the United States; a larger percentage was born in Mexico, the Philippines, Samoa, and other foreign countries. In Florida, the majority of the recently reported cases are in persons born in Cuba. In Hawaii the majority of recently reported cases are in persons born in the Philippines and Samoa, and in New York City, the majority of recently reported cases are in persons born in Puerto Rico and other Caribbean Islands. The largest number of cases of leprosy in persons born in the United States are reported in Puerto Rico and Texas. A large portion of the Texas cases are in persons with Spanish surname and/or of Mexican birth.

Although in the early 1900's, there were cases of leprosy in immigrants from Scandinavia in the upper Mississippi Valley, only one case in a person of Scandinavian ancestry had been reported in the last 20 years. The patient was from Minnesota. Apparently this focus has disappeared.

Only 755 of the 1,820 cases newly reported from 1949-1968 have been admitted to the USPHS Hospital at Carville. Other cases have been admitted to hospitals in Hawaii, Puerto Rico, and more recently to USPHS Hospitals in San Francisco and New York City. The majority of patients admitted to Carville have had lepromatous or dimorphous leprosy, possibly because outpatient facilities are used for treatment and care of patients with tuberculoid leprosy without complications.

There were 346 Negroes admitted to Carville in the interval 1900-1968, the majority from Louisiana. Of 53 Negro patients with leprosy admitted after 1949, 31 (58 percent) had lepromatous leprosy, a frequency greater than might be expected on the basis of experience in Africa where tuberculoid leprosy is a higher percentage of the total.

Leprosy was diagnosed in 187 persons who entered the military service after 1940 and were diagnosed before 1968. For various epidemiologic reasons, only 30 were considered to have had an almost definite exposure overseas. In these individuals, there was an average of 9 to 11 years between the exposure overseas and the diagnosis of lepromatous leprosy and an average of 3 to 5 years between exposure overseas and the diagnosis of tuberculoid leprosy.

The State and Territorial Epidemiologists at a meeting in May 1969 requested: The reporting of leprosy on the weekly morbidity telegrams; a single form for reporting of leprosy; and modification of foreign quarantine regulations to allow entry into the country of persons with indeterminate and tuberculoid leprosy.

II. INTRODUCTION

Information on newly diagnosed cases of leprosy has not often included age, sex, and details of the diagnosis, but only numbers of cases reported each year. In addition, some cases have been reported many years after diagnosis and others have been reported several times due to change in residence. Information presented in this surveillance report, therefore, differs from the total number of cases reported annually in the Morbidity and Mortality Weekly Report Annual Summaries and from the numbers reported annually from any particular state. In order to have relatively comparable figures from all states throughout the 20 years covered in this report, cases have been tabulated from the year of report or year of diagnosis (if the year of report has been many years subsequent to the year of diagnosis). Although it would be preferable to tabulate only cases with a biopsy confirmed diagnosis, in some instances either biopsy reports were not available, or information other than biopsy was used in confirming the diagnosis. Complete information on age, sex, birth place, characteristics of clinical illness, and other epidemiologic information has not been available on every case. Omissions due to incomplete information are noted on the appropriate tables.

In obtaining information about cases, information was requested both from the Leprosy Registry at the USPHS Hospital at Carville, Louisiana, and from state epidemiologists. The final figures, therefore, although differing from those presented in the Morbidity and Mortality Weekly Annual Summaries, accurately represent total numbers of cases diagnosed and reported by the states. The information concerns reported cases and not necessarily cases presently living or under surveillance.

III. GENERAL

A. Cases reported in 1968

In 1968, leprosy surveillance forms were received on cases in Texas, California, Hawaii, Louisiana, Florida, New York City, and Puerto Rico either directly from the state, or from the Leprosy Registry, USPHS Hospital, Carville. Information on cases from other states was received either directly from the state or from the USPHS Hospitals in Staten Island and San Francisco, or the Leprosy Registry, USPHS Hospital, Carville. Tabulations for 1968 do not include cases previously known and treated but not reported (these have been included in tabulations for the year in which treatment was initiated), cases transferring from one state to another, and cases previously lost to follow-up but now under surveillance.

Of 147 cases reported for the first time in 1968, 63 (43 percent) were born in the United States, including Puerto Rico, and an additional 65 (43 percent) were born in Mexico, the Philippines, Cuba, and Samoa (Table 1).

Table 1

Place of birth and report--newly diagnosed leprosy cases, United States 1968

Birthplace	Place of report: Calif.	Florida	Hawaii	Louisiana	NYC	Puerto Rico	Texas	Other U.S.	Total
California	-	-	-	-	-	-	-	-	0
Florida	-	1	-	-	-	-	-	-	1
Hawaii	-	-	5	-	-	-	-	-	5
Louisiana	-	-	-	3	-	-	3	-	6
New York City	-	-	-	-	-	-	-	-	0
Puerto Rico	-	-	-	-	1	26	-	1	28
Texas	-	1	-	1	-	-	16	-	18
Other USA	1	-	-	-	-	-	2	2	5
Mexico	15	-	-	-	-	-	6	-	21
Philippines	7	-	12	-	-	-	-	1	20
Cuba	-	13	-	-	-	-	-	1	14
Samoa	6	-	3	-	-	-	-	1	10
Other foreign	6	1	-	-	5	-	-	3	15
Unknown							2	2	4
Totals	35	16	20	4	6	26	29	11	147

Information concerning age, sex, and histologically confirmed diagnosis was available on 118 of the patients reported in 1968 (Table 2). Thirty-three percent were diagnosed under the age of 30, and 15 percent after the age of 50. The youngest patient was a 6-year-old girl and the oldest patient an 84-year-old woman. Seventy-eight of 118 patients (66 percent) had a diagnosis of lepromatous or dimorphous leprosy. There were almost equal numbers of males and females (61 males, 57 females).

Table 2

Age, sex, and clinical type of 118 newly diagnosed cases, 1968, on which information is available

Age in years at diagnosis	Lepromatous and Dimorphous: Male	Female	Total	Tuberculoid and Indeterminate: Male	Female	Total	Total	Cummulative percent
0- 4	0	0	0	0	0	0	0	0
5- 9	0	0	0	1	1	2	2	2
10-19	1	4	5	3	2	5	10	10
20-29	10	9	19	2	6	8	27	33
30-39	11	6	17	6	3	9	26	55
40-49	9	1	10	4	6	10	20	72
50-59	6	7	13	2	0	2	15	85
60-69	3	6	9	1	0	1	10	93
70 +	2	3	5	0	3	3	8	100
Totals	42	36	78	19	21	40	118	

B. Twenty-year summary, 1949-1968

Cases of leprosy reported or diagnosed in the United States from 1949 to 1968 are recorded by state and by 5-year periods in Table 3; cases are recorded by year since 1964 in Table 4. Of the 1,820 cases reported in this 20-year period, 1,612 were reported from California, Florida, Hawaii, Louisiana, New York City, Puerto Rico, and Texas. Information about cases reported in these seven areas is described in detail separately. The incidence for newly diagnosed and reported cases per year is shown in Figure 1.

Figure 1 INCIDENCE OF LEPROSY, U.S.A. AND PUERTO RICO, 1949-1968

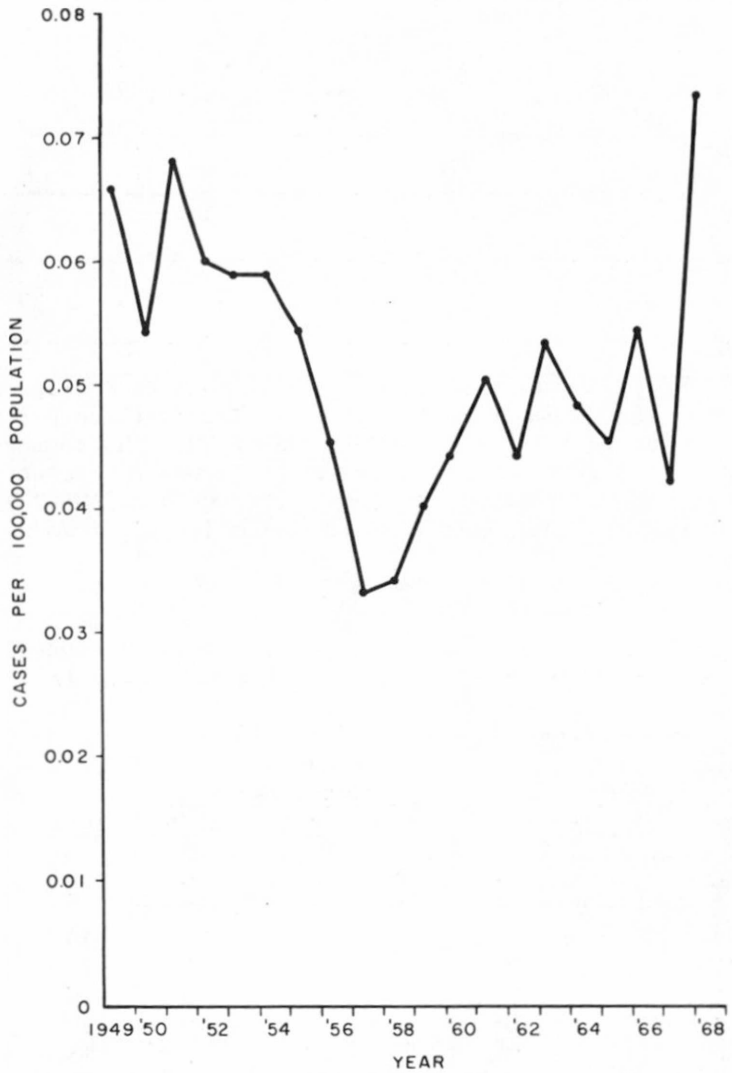


Table 3

Cases of leprosy by year of diagnosis or report
USA and Puerto Rico*

States	1949	50-54	55-59	60-64	65-68
Alabama	-	2	-	4	1
Alaska	-	-	-	-	-
Arizona	1	2	3	2	4
Arkansas	-	1	-	-	-
California	12	64	60	100	107
Colorado	-	1	-	1	1
Connecticut	-	2	-	1	3
Delaware	-	2	-	-	-
District of Columbia	1	1	1	1	1
Florida	3	11	8	19	43
Georgia	-	3	1	1	2
Hawaii	32	119	77	71	66
Idaho	-	-	-	-	-
Illinois	1	4	7	4	6
Indiana	-	2	1	5	3
Iowa	-	-	4	1	1
Kansas	-	-	-	3	3
Kentucky	-	-	-	1	-
Louisiana	4	21	18	11	11
Maine	-	-	-	-	-
Maryland	-	-	1	3	4
Massachusetts	-	1	5	1	6
Michigan	1	-	4	2	-
Minnesota	-	1	-	5	-
Mississippi	1	-	1	-	-
Missouri	-	2	-	1	-
Montana	-	-	1	-	-
Nebraska	-	-	-	1	1
Nevada	-	-	1	-	-
New Hampshire	-	-	-	-	-
New Jersey	-	1	1	3	5
New Mexico	-	1	1	1	-
New York**	13	40	26	53	23
North Carolina	-	3	2	3	-
North Dakota	-	-	-	-	-
Ohio	-	4	1	4	-
Oklahoma	-	-	-	-	1
Oregon	-	-	-	6	1
Pennsylvania	-	1	1	1	3
Rhode Island	-	-	-	-	1
South Carolina	-	-	-	-	-
South Dakota	-	-	-	-	-
Tennessee	-	1	1	-	-
Texas	15	99	84	91	80
Utah	-	-	-	-	1
Vermont	-	-	2	-	-
Virginia	-	2	2	4	1
Washington	1	1	1	2	3
West Virginia	-	-	1	1	-
Wisconsin	-	-	-	3	-
Wyoming	-	-	-	-	-
Puerto Rico	13	88	41	46	47
Total	98	480	357	456	429

*Compiled from records at NCDC, Carville, and individual states.
**All cases except 4 during 1960-1964 were reported from New York City.

Table 4

Cases of leprosy by year of diagnosis or report
USA and Puerto Rico* - 1964-1968

States	1964	1965	1966	1967	1968
Alabama	-	-	1	-	-
Alaska	-	-	-	-	-
Arizona	1	1	1	2	-
Arkansas	-	-	-	-	-
California	25	19	31	22	35
Colorado	1	-	1	-	-
Connecticut	-	-	1	-	2
Delaware	-	-	-	-	-
District of Columbia	-	-	1	-	-
Florida	1	5	16	6	16
Georgia	-	-	2	-	-
Hawaii	10	19	14	13	20
Idaho	-	-	-	-	-
Illinois	-	3	-	3	-
Indiana	-	-	2	-	1
Iowa	-	-	1	-	-
Kansas	1	1	-	-	2
Kentucky	1	-	-	-	-
Louisiana	2	1	4	2	4
Maine	-	-	-	-	-
Maryland	1	1	-	1	2
Massachusetts	-	2	1	3	-
Michigan	1	-	-	-	-
Minnesota	1	-	-	-	-
Mississippi	-	-	-	-	-
Missouri	-	-	-	-	-
Montana	-	-	-	-	-
Nebraska	-	1	-	-	-
Nevada	-	-	-	-	-
New Hampshire	-	-	-	-	-
New Jersey	-	-	-	2	3
New Mexico	-	-	-	-	-
New York**	6	8	6	3	6
North Carolina	1	-	-	-	-
North Dakota	-	-	-	-	-
Ohio	-	-	-	-	-
Oklahoma	-	-	1	-	-
Oregon	-	-	1	-	-
Pennsylvania	-	-	2	1	-
Rhode Island	-	-	-	1	-
South Carolina	-	-	-	-	-
South Dakota	-	-	-	-	-
Tennessee	-	-	-	-	-
Texas	32	22	13	16	29
Utah	-	-	-	1	-
Vermont	-	-	-	-	-
Virginia	1	-	-	-	1
Washington	-	-	3	-	-
West Virginia	-	-	-	-	-
Wisconsin	1	-	-	-	-
Wyoming	-	-	-	-	-
Puerto Rico	7	6	6	9	26
Total	93	89	108	85	147

*Compiled from records at NCDC, Carville, and individual states.
**All cases reported from New York City

IV. REPORTS FROM THE STATES

A. California

There were 343 cases of leprosy diagnosed in California in the 20-year-period from 1949 to 1968 (Table 5). Of these, only 24 (7 percent) were born in California, and 47 (14 percent) were born elsewhere in the United States. Of the remainder, 128 (37 percent) were born in Mexico, 58 (17 percent) were born in the Philippines, 27 (8 percent) were born in Samoa, 55 (16 percent) were born in other foreign countries and for 4 cases, the place of birth is unknown. Over the 10-year period, 1956 to 1965, the incidence, using the 1960 census information, for persons of Mexican birth was 2.3 per 100,000 per year, for persons of Philippine birth 4.1 per 100,000 per year, and for all persons in California 0.11 per 100,000 per year.

Table 5

Place of birth of new cases of leprosy reported from California
1949-1968

	Place of birth							
Year	Mexico	Philippines	Samoa	Other foreign	California	Other USA	Unknown	Total
1949	1	4	0	4	3	0	0	12
1950-54	27	5	1	8	6	16	1	64
1955-59	18	13	5	11	4	9	0	60
1960-64	41	16	8	14	4	17	0	100
1965-68	41	20	13	18	7	5	3	107
1949-68	128	58	27	55	24	47	4	343

Beginning in 1969, information concerning current cases with relatives in Mexico is being exchanged with the equivalent surveillance division in the Department of Public Health in Mexico to insure adequate examination of contacts and possible sources of infection.

The California leprosy surveillance program is handled from one central office, now under the supervision of the state tuberculosis program, and there are two outpatient centers for diagnosis, one in San Francisco and one in Los Angeles. The center in San Francisco at the USPHS Hospital also serves to handle patients needing hospitalization so that the majority of California patients requiring hospitalization are no longer sent to the USPHS Hospital at Carville, unless they require highly specialized rehabilitation efforts.

B. Florida

Eighty-four cases of leprosy were reported in Florida during the period, 1949 to 1968, mostly related to Monroe County (Key West) and Cuba (Table 6). In the last decade cases from Monroe County have decreased and cases in persons of Cuban birth have increased.

Table 6

Place of birth of new cases of leprosy reported from Florida
1949-1968

Year	Place of birth				Total
	Florida	Cuba	Other	Unknown	
1949	3	0	0	0	3
1950-54	8	0	3	0	11
1955-59	4	1	3	0	8
1960-64	7	7	4	1	19
1965-68	6	32	5	0	43
1949-68	28	40	15	1	84

The majority of the leprosy cases reported from Florida in the past have come from Monroe County, which includes the City of Key West. In recent years, however, few cases have been reported in persons either born or exposed in Monroe County.

Table 7

Leprosy in Monroe County, Florida
1880-1968

Decade	Population	Cases reported	Incidence by year of report*	Recorded onset**	Incidence by year of onset*
1880-89		1		1	
1890-99	18,786	6	3.2	4	2.1
1900-09	18,006	3	1.7	2	1.1
1910-19	21.563	6	2.8	22	10.2
1920-29	19,550	34	17.4	19	9.7
1930-39	13,624	32	23.5	26	19.1
1940-49	14,078	24	17.0	14	9.9
1950-59	29,957	14	4.7	7	2.3
1960-68	47,921	5	1.0	2	0.4

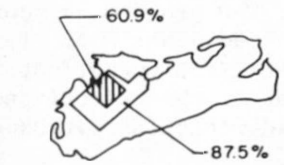
* per 100,000 population per year

**not given in 28 cases

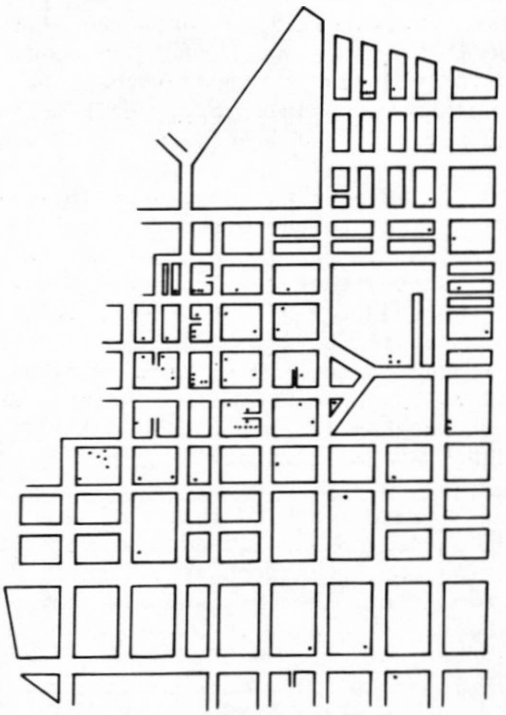
Table 7 shows a high incidence in Monroe County from 1910 to 1930 followed by a continuing decrease. In a report in 1953, Badger[1] described the location of many of the cases and that showed they had lived in a small section of old Key West (Figure 2). Most of the cases were described as lepromatous, although diagnostic criteria have changed since these diagnoses were made.

1. Badger, L. Leprosy in Florida. J. Fla. Med. Assoc. 39:573-578, 1953.

Fig. 2 CONCENTRATION OF LEPROSY IN KEY WEST, 1920-1950



AREA OF CONCENTRATION



RESIDENCES OF PATIENTS WITHIN AREA

Cases of leprosy in persons of Cuban birth were relatively infrequent both in Florida and in the remainder of the United States until the appearance of a large number of Cuban refugees in the United States (especially in Florida) during the 1960's (Table 8). During the interval, 1964-1968, of 44 cases of leprosy diagnosed in Florida, 32 were in Cubans (Table 9).

Table 8

Leprosy reported in the United States in persons of Cuban birth

Year	Reported from Fla.	Reported from other states	Total
1930-39	2	2	4
1940-49	0	2	2
1950-59	1	7	8
1960-68	39	8	47
Total	42	19	61

Table 9

Leprosy reported in Florida in persons born in Cuba

Year:	1964	1965	1966	1967	1968	1964-68
Cuban birth	0	4	13	2	13	32
Florida total	1	5	16	6	16	44

Thirty of the 39 Cuban-born cases reported from Florida since 1960 were detected during the examination conducted at the point of entry of Cuban refugees into the United States by air lift. Nineteen had already been on therapy in Cuba. Of 10 individuals examined at the Cuban Refugee Emergency Center (CREC) and who subsequently developed leprosy, three were diagnosed within 1 year, three between 2 and 5 years, and 4 between 6 to 8 years after entry into the country.

Prior to 1968 it had been the procedure in several counties in Florida to transfer patients with leprosy to the USPHS Hospital in Carville where they would remain for further treatment. Following a recent reevaluation of this policy in Dade County, patients are treated either on an outpatient basis in Miami or initially at Carville and subsequently as outpatients in Dade County. The program is coordinated by the epidemiologist for Dade County in conjunction with the Department of Dermatology in the University of Miami Medical School, the USPHS Outpatient Clinic in Miami, and the Jackson Memorial Hospital. An evaluation of the effectiveness of the outpatient program is part of the activity of the epidemiologists in Dade County and the State of Florida.

One case from Florida reported in 1968 had a relatively complicated epidemiologic history. The patient was born and lived in Texas until 1961 when she moved to southern Florida and began work as a migrant laborer. Early in 1968, she went to Michigan as a migrant laborer. While there, she visited a migrant worker health clinic and the doctor diagnosed a skin problem of several months duration as leprosy. Following biopsy confirmation, the doctor reported his diagnosis to departments of public health in Texas, Florida, Michigan, and also to Oklahoma, since the patient mentioned one of her recent contacts in a migrant worker's camp had a similar skin condition and was from Oklahoma. Examination of this contact in Oklahoma confirmed a brief and recent contact, but no evidence of disease. Examination of contacts in Texas led to discovery of a case of dimorphous leprosy in a sister-in-law.

C. Hawaii

During the period, 1949 to 1968, 365 cases of leprosy were reported in Hawaii (Table 10). Approximately 20 cases have been recorded each year since 1956 (Figure 3). Although the majority of the cases reported in the 20-year period were in persons of Hawaiian birth, in the last decade more cases have occurred in persons born outside of Hawaii. In 1968 only 5 of the 20 cases were born in Hawaii; 11 were born in the Philippines, and 4 in Samoa.

Table 10

Age, sex, and clinical type of newly diagnosed cases of leprosy in Hawaii 1949-1968

Year of report	Lepromatous and Dimorphous			Tuberculoid and Indeterminate			Total
	Male	Female	Total	Male	Female	Total	
1949-58	62	34	96	77	49	126	222
1959-68	37	15	52	42	49	91	143
1949-68	99	49	148	119	98	217	365

FIGURE 3
NEW CASES OF LEPROSY IN HAWAII BY YEAR OF REPORT, 1920-1968

Forty-one percent of the cases reported from 1949 to 1968 have been lepromatous or dimorphous (Table 10). This high percentage of lepromatous patients includes a preponderance of Philippine males and adults from Samoa in addition to persons born in Hawaii (Table 11).

Table 11

Place of birth of newly diagnosed cases of leprosy in Hawaii
1949-1968

Year of report	Place of birth				
	Hawaii	Philippines	Samoa	Other	Unknown
1949-58	148	49	10	12	3
1959-68	64	49	24	6	0
1949-68	212	98	34	18	3

Only 20 percent of patients had onset or first report of disease under the age of 20 years (Table 12). The majority of patients had an interval of less than 1 year between onset of clinical symptoms and diagnosis, and in many instances, less than 6 months. Approximately 50 percent of the cases in Hawaii from 1949 to 1968 had a history of another case in their family (Table 13).

Table 12

New cases of leprosy in Hawaii
1949-1968

Age in years and percentage of persons at onset or report

Year of report	0-9	%	10-19	%	20-29	%	30-39	%	40-49	%	50-59	%	60-69	%	70-79	%	80-89	%	Tota
1949-1958	3	1	52	23	62	28	32	14	38	17	16	7	11	5	7	3	1	0	222
1959-1968	8	6	11	8	37	26	23	16	27	19	24	17	9	6	4	3	0	0	143
1949-1968	11	3	63	17	99	27	55	15	65	18	40	11	20	5	11	3	1	0	365

Table 13

New cases of leprosy in Hawaii
1949-1968

Presence of additional case in the family

Year of report	Present	Total cases	Percent present
1949-1958	106	221	48
1959-1968	79	139	55
Total	185	360*	51

*excludes 5 without information

The majority of the cases occurring in patients of Philippine birth gave no history of known cases in the family in the Philippines. Case finding in family members has been more significant in Hawaiian-born patients than in other ethnic groups. In 1968, 3 of the 5 Hawaiian patients diagnosed had a family contact and in the 5-year period, 1964-1968, 21 of 29 patients had a family contact. The short interval between onset of illness and diagnosis in Hawaii is quite possibly associated with long established health education activities of the department of health. In addition to other health educational activities, a minimum experience in the diagnosis and therapy of leprosy is required of all physicians prior to obtaining a medical license in Hawaii.

a. Leprosy in persons of Hawaiian birth

The number of cases of leprosy in pure Hawaiians fell steadily during the period, 1866-1927 (Figure 4), as did the total number of cases in Hawaii. Only a small proportion of cases were in persons other than pure Hawaiians. During the same period the population of pure Hawaiians dropped steadily, while the total population rose steadily (Figure 5). During the period, 1866-1927, the incidence of cases in pure Hawaiians remained relatively constant, while the incidence for the whole population fell steadily (Figure 6). Although it is possible the overall reduction in number of cases and incidence is related to the compulsory hospitalization and restriction of movement of patients with diagnosed leprosy, it is equally possible that the change in the incidence of leprosy in Hawaii is related to the relatively steady decrease in persons of Hawaiian birth of Hawaiian parents.

b. Leprosy in persons of Philippine birth

Filipinos were the last major ethnic group to enter the territory of Hawaii with some 120,000 persons, predominantly plantation laborers entering between 1927 and 1931. In 1930, 17 percent of the population of Hawaii was of Philippine birth. The percentage of persons of Philippine birth or born of Filipino parents has declined so that the census for 1960 showed less than 12 percent Filipinos.

In the 20-year period from 1949 through 1968, slightly over 25 percent of the cases of leprosy diagnosed in Hawaii were in persons of Philippine birth. Tables 14, 15, and 16 show the number of persons of Philippine birth who have developed leprosy, their age on entry to Hawaii, and the interval from entry to clinical diagnosis. A significant proportion of patients had clinical diagnosis (12/29 lepromatous and dimorphous, 25/62 tuberculoid and indeterminate) more than 20 years after entry into Hawaii. The incidence of leprosy in persons of Philippine birth in Hawaii shows a decline from 1942 to 1962, with a subsequent slight increase. In contrast, there has been a steady decline in the incidence of leprosy in persons of Hawaiian birth (Figure 7).

Figure 4 CASES OF LEPROSY IN PURE HAWAIIANS AND ALL PERSONS IN HAWAII, 1866-1927

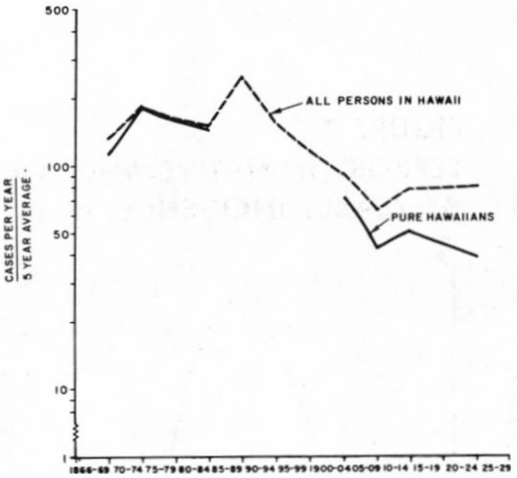


Figure 5 NUMBER OF PURE HAWAIIANS AND ALL PERSONS IN HAWAII, 1866 - 1927

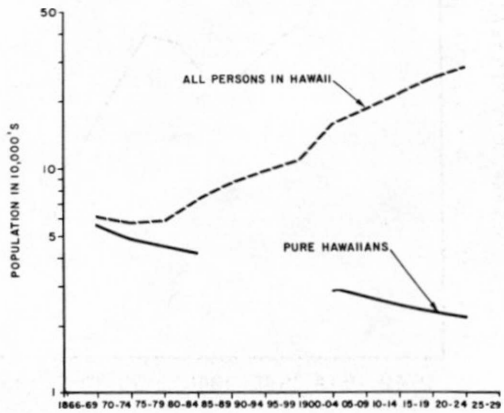


Figure 6 INCIDENCE OF LEPROSY IN PURE HAWAIIANS AND ALL PERSONS IN HAWAII, 1866-1927

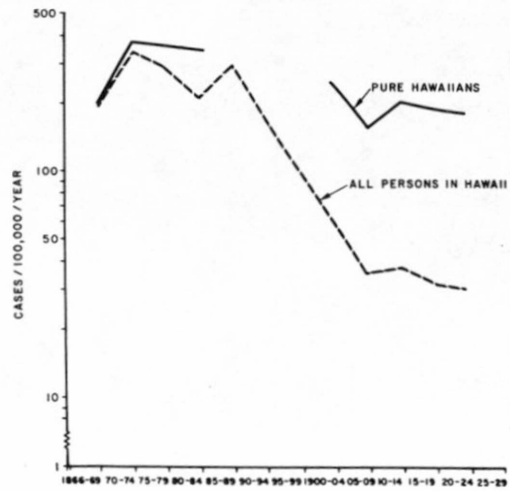
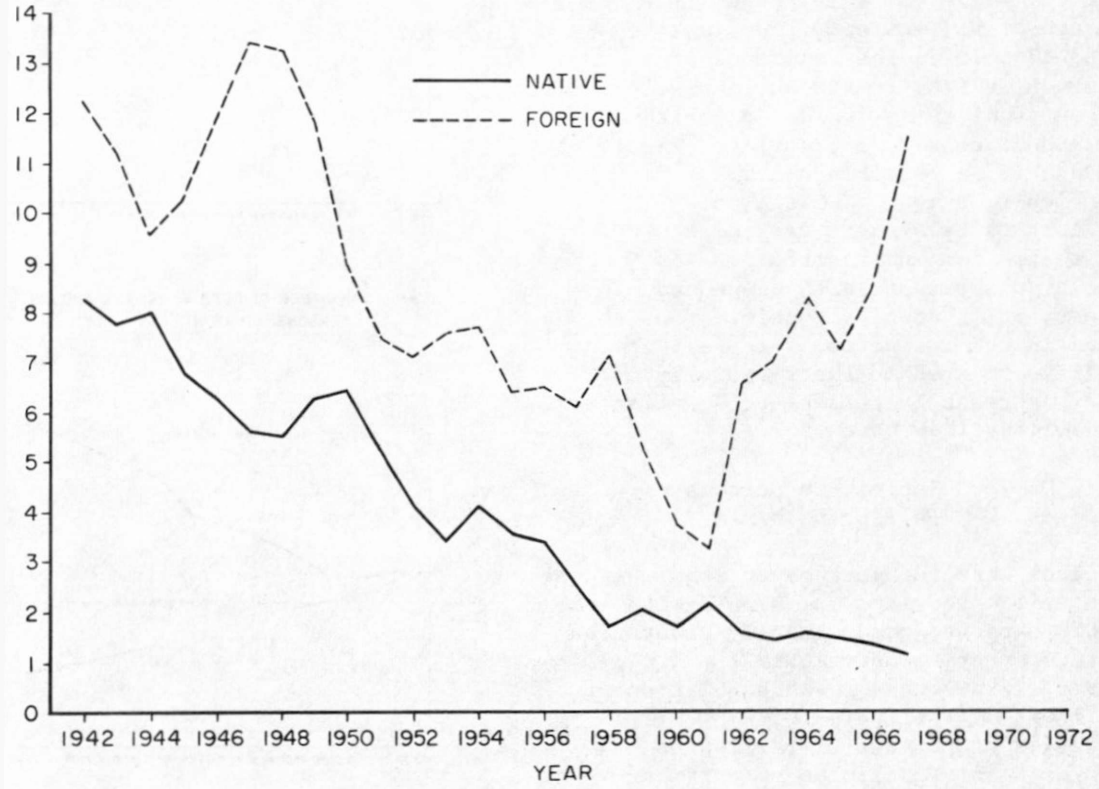


FIGURE 7
LEPROSY IN NATIVE-AND FOREIGN-BORN RESIDENTS OF HAWAII, BY YEARLY INCIDENCE, 1942- 1968



The problems of leprosy surveillance in Hawaii are coming to resemble those in California, Florida, and New York, in that a large number of cases have presumably been exposed to leprosy before moving to the state and are developing recognizable disease many years after exposure.

Table 14

New cases of leprosy in Filipino's living in Hawaii, by type, and year of diagnosis, 1949-1968

Year	Lepromatous and Dimorphous		Indeterminate and Tuberculoid		Total	
	Male	Female	Male	Female	Male	Female
1949	3	0	5	0	8	0
1950-54	9	1	17	0	26	1
1955-59	3	0	9	6	12	6
1960-64	2	0	6	7	8	7
1965-68	8	3	6	6	14	9
1949-1968	25	4	43	19	68	23

Table 15

New cases of leprosy in Filipino's living in Hawaii by interval from entry to onset and age at entry 1949-1968

Twenty-nine lepromatous and dimorphous cases

Age in years at entry	Male	Female	Interval from entry to onset (years)					
			<1	1-4	5-9	10-19	20-29	30 plus
0- 9	0	0	0	0	0	0	0	0
10-19	7	1	0	2	0	2	2	2
20-29	12	2	1	5	0	1	3	4
30-39	4	1	1	2	1	0	1	0
40-49	2	0	2	0	0	0	0	0
Total	25	4	4	9	1	3	6	6

Table 16

New cases of leprosy in Filipino's living in Hawaii by interval from entry to onset and age at entry 1949-1968

Sixty-two tuberculoid and indeterminate cases

Age in years at entry	Male	Female	Interval from entry to onset (years)					
			<1	1-4	5-9	10-19	20-29	30 plus
0- 9	1	0	0	1	0	0	0	0
10-19	12	1	0	1	0	0	11	1
20-29	22	6	5	5	3	3	5	7
39-39	7	5	0	4	4	3	0	1
40-49	1	4	2	3	0	0	0	0
50-59	0	2	0	2	0	0	0	0
60-69	0	0	0	0	0	0	0	0
70-79	0	1	0	1	0	0	0	0
Total	43	19	7	17	7	6	16	9

D. Louisiana

From 1949 to 1968, there were 65 cases of leprosy reported in Louisiana (Table 17). All but nine of these individuals were born in Louisiana; five were born in the adjoining states of Texas and Mississippi.

Leprosy was frequently reported in Louisiana in the 1880's, and subsequent to diagnosis, patients were first confined in the infectious disease hospital in New Orleans. In 1894 a Louisiana State Hospital for leprosy patients (Louisiana Leper Home) was founded at Carville, Louisiana. This institution was purchased by the federal government in 1920 and since February 1921 has been operated as a USPHS Hospital.

The majority of the patients from Louisiana came from the southeastern portion of the state in an area settled by a group of people called "Acadians" or "cajuns" because of their relationship to early French settlers who came from "Acadia", an early name for a portion of Newfoundland in Canada. Meyer[1] has described the history of the occurrence of leprosy in Louisiana.

In recent years, the USPHS Outpatient Clinic in New Orleans has been utilized in outpatient care and follow-up of some Louisiana patients and has been important in the continuing examination of contacts.

Table 17

New cases of leprosy reported in Louisiana by type, sex, and year of report 1949-1968

Year	Lepromatous and Dimorphous			Tuberculoid and Indeterminate			Total
	Male	Female	Combined	Male	Female	Combined	
1949	3	0	3	0	0	0	3
1950-54	3	5	8	6	7	13	21
1955-59	5	4	9	5	2	7	16
1960-64	4	1	5	3	3	6	11
1965-68	5	5	10	1	0	1	11
1949-1968	20	15	35	15	12	27	62*

*does not include one case in 1949 and 2 cases in 1955 without report of type of illness.

E. New York City

Since 1949, 148 new cases of leprosy were diagnosed in New York City (Table 18). Fifty-eight of these patients were born in Puerto Rico; a total of 101 were from Puerto Rico and other areas of the Caribbean. Of the remaining cases, 14 were from China, 8 from South America, 6 from Europe, 2 from Africa, 2 from the Philippines, and in 9 the data are incomplete. Six patients were born in the United States but none in New York City, although persons born in New York City have been reported as cases from other states.

1. Meyer, W. A. History of Leprosy in Louisiana. J. La. State Med. Assn. 107:359-366. 1955.

Table 18

Place of birth of new cases of leprosy reported from New York City
1949-1968

Year	Puerto Rico	Other Caribbean	USA	South America	China	Others	Not given	Total
1949	7	1	0	1	1	3	0	13
1950-54	20	4	3	2	7	4	0	40
1955-59	10	8	1	1	3	2	1	26
1960-64	16	19	1	1	2	0	7	46
1965-68	51	11	1	3	1	1	1	23
1949-68	58	43	6	8	14	10	9	148

A large percent of the patients are followed as outpatients at clinics of the Tropical Disease Division of the New York City Health Department; a few are seen by private physicians. In recent years an increasing number of patients diagnosed in New York City have been hospitalized or seen as outpatients at the Staten Island USPHS Hospital.

Patients from Connecticut, Maryland, New Jersey, and other parts of the northeast are also referred to the Staten Island USPHS Hospital. Patients are admitted to the dermatology ward and are not otherwise isolated or restricted within the hospital.

F. Puerto Rico

There have been 237 cases of leprosy diagnosed in persons of Puerto Rican ancestry, either on the Island of Puerto Rico or mainland United States from 1949-1968 (Table 19). Information concerning these cases was obtained by review of the records of the New York City Tropical Disease Program, the 1968 records of the Pathology Department of the Puerto Rico Medical School, a limited review of cases known to private dermatologists in San Juan, a listing of cases compiled in 1966 by a group of authors from a review of all sources available on the Island of Puerto Rico[1], and a list of patients of Puerto Rican birth known at the leprosy registry at Carville.

Table 19

Leprosy reported in the United States in persons of Puerto Rican birth

Year	Place of report: Puerto Rico	NYC	Other states	Total
1949	6	7	0	13
1950-54	67	20	1	88
1955-59	31	10	0	41
1960-64	28	16	2	46
1965-68	43	5	1	49
1949-1968	175	58	4	237

1. Leopold, N. Puerto Rico Department of Health. Personal Communication.

An average of 12 cases of leprosy in patients born in Puerto Rico have been reported each year; however, 28 cases were reported in 1968. Case reporting is known to be incomplete and it is probable that there are more new Puerto Rican cases under therapy each year than are reported.

Since 1960, when information concerning biopsy diagnosis was available on most of the patients, over 75 percent have been lepromatous (30/41). Twelve percent were under 20 years of age and 46 percent were over 50 years of age when first reported. No information is available concerning the frequency of leprosy in contacts of known cases. However, in published reports 20 percent of the patients reported a second case in the family at the time of the initial diagnosis.[1] The present control program in Puerto Rico is coordinated by the Department of Dermatology at the University of Puerto Rico Medical School. Their Dermatology Department supervises a hospital in Trujillo Alto for prolonged hospital care and handles the follow-up at the outpatient clinic at the medical center. The large number of cases reported in 1968 resulted from a review of biopsy diagnoses in the Department of Pathology at the medical school. Fourteen patients, under therapy and being followed monthly at the outpatient clinic, were reported for the first time as a result of this review.

G. Texas

There have been 375 new cases of leprosy diagnosed in Texas from 1949 to 1968. Beginning in 1949 a cooperative program for improving reporting and early diagnosis of leprosy was begun by the Texas State Health Department with the cooperation of Leonard Wood Memorial, Washington, D.C., and NCDC, Atlanta, Georgia. Dr. Fred C. Kluth, an epidemiologist for the cooperative program from 1949-1955, published in 1955 and 1956 an analysis of the information collected in Texas.[2,3] In 1961, the Texas State Health Department reorganized a still continuing leprosy control program under the direction of Dr. M. S. Dickerson.

Information about cases of leprosy in Texas, diagnostic procedures used and pictures of clinical cases are described in a brochure for physicians called "Leprosy Program in Texas." In this brochure and in published articles,[4,5,6] it is pointed out that cases of leprosy are found in Texas in areas of early Spanish, German, and Czechoslovak settlements and recent immigration from Mexico.

The birth place of patients diagnosed in Texas between 1949 and 1968 is shown in Table 20. There were 236 (64 percent) of the 369 patients with known birth place born in Texas. Eighty-seven (23 percent) were born in Mexico. Leprosy in Texas occurs often in persons of Spanish surname born either in Mexico or in Texas. Of 236 patients born in Texas, 169 have Spanish surnames and with an additional 87 born in Mexico, make up 69 percent (256/369) of the total diagnosed in the 20-year interval.

1. Nine-Curt, Jose, Torres, Victor N., and Leopold, Nathan F. Leprosy in Puerto Rico. Bol. Assoc. Med. Puerto Rico. 60:53-61, 1968.
2. Kluth, F. C. Leprosy in Texas: Study of Occurrence. Texas State J. of Med. 51:199-205, 1955.
3. Kluth, F. C. Leprosy in Texas: Risk of Contracting the Disease in the Household. Texas State J. of Med. 52:786-789, 1956.
4. Boyd, M. F., and Fox, W. F. Epidemiological Study of Endemic Focus of Leprosy. Public Health Reports. 35:3007, 1920.
5. Dock G. Leprosy: With Report of Two Cases. Tr. Texas M. Assn., San Antonio, 1889, pp. 190-196.
6. Johansen, F. A. Endemic Foci of Leprosy in State of Texas. Internat. J. Leprosy 15:417-423, 1947.

Table 20

Place of birth of new cases of leprosy reported from Texas
1949-1968

	Birthplace					
	Texas					
Year	SSN*	Other	Mexico	Other	Unknown	Total
1949	8	3	3	1	0	15
1950-54	42	22	24	7	4	99
1955-59	38	16	17	10	3	84
1960-64	44	14	23	9	1	91
1965-68	37	12	20	8	3	80
Total	169	67	87	35	11	369**

*Spanish surname
**does not include 6 cases with incomplete information

The frequency of lepromatous and tuberculoid leprosy and of prolonged intervals between onset and diagnosis do not appear related to birthplace or Spanish names (Tables 21, 22, and 23). In recent years an increasing percentage of persons have been diagnosed as a result of contact examinations which are part of the case finding program in Texas.

Using cases with diagnosis in the interval from 1956-1965 in Texas, and 1960 census data, calculated case rates in Texas for persons of Mexican birth were 1.6 per 100,000 per year; for persons of Spanish surname born in Texas, 0.73 per 100,000 per year; and for all persons in Texas, 0.17 per 100,000 per year.

Tabulation of information on leprosy cases in Texas, from the publications of Dr. Kluth[1] from 1930-1949, and information from the Texas State Health Department from 1949 to 1968, shows a decrease of new cases of lepromatous leprosy since the beginning of the well-organized control program (and since the use of DDS as therapy) (Table 24). The increase in the rate of new tuberculoid cases is possibly associated with active case finding activities.

1. Ibid, page 17, reference #2.

Type	Birthplace: Texas SSN** M	F	Total	%	Texas Other M	F	Total	%	Mexico M	F	Total	%	Other M	F	Total	%	Unknown M	F	Total	%	Total M	F	Total	%
Lepromatous	59	47	106	62	26	12	38	58	31	26	57	67	14	8	22	63	1	3	4	25	133	96	227	61
Dimorphous	4	9	13	8	2	3	5	7	2	7	9	10	3	0	3	8	0	1	1	6	11	20	31	8
Tuberculoid	19	23	42	25	8	13	21	30	6	11	17	20	6	4	10	29	0	4	4	26	39	55	94	25
Indeterminate	3	3	6	4	2	1	3	4	0	2	2	2	0	0	0	0	0	0	0	0	5	6	11	3
Not given	2	0	2	1	0	0	0	0	0	1	1	1	0	0	0	0	2	5	7	44	4	6	10	3
Total	87	82	169	100	38	29	67	100	39	47	86	100	23	12	35	100	3	13	16	100	192	173	373≠	100

≠ Does not include 2 cases without sex recorded. ** Spanish surname

Table 22

Interval from onset to diagnosis in new cases of leprosy in Texas by year of diagnosis
1949-1968

Year of diagnosis	Interval from onset to diagnosis in years: <1	%	1-4	%	5-9	%	10+	%	Unk.	%	Total	%	Unk.
1949	0	(0)	6	(41)	3	(18)	3	(18)	3	(24)	15	(100)	
1950-54	19	(19)	40	(40)	20	(20)	14	(14)	6	(6)	99	(100)	
1955-59	18	(21)	32	(38)	11	(13)	14	(17)	9	(11)	84	(100)	
1960-64	19	(21)	34	(38)	19	(21)	15	(16)	4	(4)	91	(100)	
1965-68	12	(15)	22	(27)	22	(28)	18	(22)	6	(7)	80	(100)	
Total	68	(18)	134	(36)	75	(20)	64	(17)	28	(8)	369	(100)	6

Table 23

Interval from onset to diagnosis in new cases of leprosy in Texas by year of diagnosis 1949-1968

Place of birth	Interval from onset to diagnosis in years											
	<1	%	1-4	%	5-9	%	10 +	%	Unk.	%	Total	%
Texas SSN	27	(16)	60	(36)	38	(23)	36	(21)	8	(5)	169	(100)
Texas other	13	(19)	30	(44)	10	(16)	10	(14)	4	(7)	67	(100)
Mexico	18	(21)	34	(40)	21	(24)	10	(11)	4	(5)	87	(100)
Other	9	(26)	10	(27)	6	(17)	7	(20)	3	(9)	35	(100)
Unknown	1	(6)	0	(0)	0	(0)	1	(6)	15	(88)	17	(100)
Total	68	(18)	134	(36)	75	(20)	64	(17)	34	(9)	375	(100)

Table 24

Trend in the incidence of leprosy in Texas 1930-1968

Year	Lepromatous and Dimorphous		Tuberculoid and Indeterminate	
	Number	Cases Per 100,000/year	Number	Cases per 100,000/year
1930-34	55	0.18	8	.027
1935-39	57	0.18	9	.029
1940-44	44	0.13	12	.036
1945-49	68	0.19	7	.019
1950-54	69	0.17	29	.069
1955-59	61	0.14	21	.047
1960-64	59	0.12	30	.060
1965-68	55	0.10	23	.042

H. Leprosy in the upper Mississippi Valley

The disappearance of leprosy after its introduction by Scandinavian settlers into the upper Mississippi Valley has been of continued interest to those interested in the epidemiology of leprosy[1]. Leprosy was a significant problem in Scandinavia during the last half of the 19th Century, most prominently in Norway, where over 4,000 new cases were reported from 1856 to 1895. There were 170 cases of leprosy found in Norwegian-born immigrants to the United States, only 20 of whom had been diagnosed as having leprosy before they left Norway. A study of these individuals, their family members, and other people who lived with them was of great interest to Norwegian physicians attempting to determine whether leprosy was a disease of a hereditary character, a disease related to climate, environment and occupation, or an infectious disease. Three senior physicians responsible for studies of leprosy in Norway came separately to the United States to study cases in Norwegian immigrants in the upper Mississippi Valley.

Dr. Jeans Andreas Holmboe, Surgeon-in-Charge of the Hospital of Lepers in Bergen, Norway, visited the United States in 1864, to study the influence of climate and living conditions on the disease. He saw 12 cases, 10 of whom had had leprosy in

1. Washburn, W. L. Leprosy Among Scandinavian settlers in the upper Mississippi Valley, 1932-1964. Bull. Hist. Med. 24:123-148, 1950.

Norway before immigration. From his study he concluded that the climate and environment in the United States was less of a stress on persons with leprosy than conditions in Norway.

In 1869, Dr. William Boeck visited Iowa, Wisconsin, and Minnesota and observed 18 cases of leprosy. Of these 18 cases, nine had had their disease before arrival in the United States and eight of the nine others came from families where the disease was known to exist in Norway. Dr. Boeck concluded that the disease was of hereditary character, having already been convinced from previous studies in Norway that the disease was not contagious.

In 1888, Dr. G. Armauer Hansen, who described the leprosy bacillus in 1873, visited the United States to observe the effect of immigration on leprosy patients, their families, and their contacts living in the community. With the assistance of Scandinavian physicians living in the United States, he found records of a total of 160 leprosy patients in Wisconsin, Minnesota, and Dakota, only 13 of whom were alive in 1888. Dr. Hansen was able to visit children or review records of examinations of children and even grandchildren of these 160 patients. Not one sibling, family member, or other contact born in the United States was found to have leprosy. He concluded, as he had believed before coming to this country, that leprosy was an infectious disease, neither hereditary, nor the result of environment.

Subsequent to Dr. Hansen's visit, there was continued recording of information on individuals with leprosy, especially in Minnesota. The first case of leprosy in a Minnesota-born patient was reported in 1901 and subsequently there have been a total of 10 Minnesota-born residents reported with leprosy; all but one with some Scandinavian background.

Two Minnesota-born cases were diagnosed in California and were the only Minnesota-born persons with leprosy diagnosed since 1949. One was a Mexican who had moved to Mexico after his birth in Minnesota and one a man of Finnish background, seen in a major medical clinic in Minnesota and misdiagnosed as syringomyelia, whose illness was later diagnosed in California[1].

V. REPORTS FROM CARVILLE

Since 1921 when the federal government took over the Louisiana Leper Home at Carville, Louisiana, and it became a USPHS Hospital, it has been a center for the care of leprosy patients, for research, and for the training of physicians and paramedical workers in the clinical diagnosis and care of patients with leprosy.

Only a portion of the leprosy patients diagnosed in the United States and Puerto Rico have been hospitalized at Carville. A large percentage are hospitalized outside of the Continental United States in Hawaii and Puerto Rico; other patients are seen at USPHS Hospitals in San Francisco and Staten Island, or in USPHS outpatient facilities at San Pedro, California, or Miami, Florida.

There have been 755 first admissions of patients with leprosy to the USPHS Hospital in Carville in the period 1949 to 1968. These hospitalized patients have most frequently been referred from Texas and California. However, patients have come from several other states and foreign countries (Table 25). The largest number of Carville patients have been born in Texas and Mexico. A total of 436 (58 percent) were born in the United States and 319 born in foreign countries (Table 26).

1. Fasal, P. Differential diagnosis of Leprosy. Internat. J. Leprosy 33:454-465, 1965.

Table 25

First admissions of patients with leprosy to Carville by place of referral
1949-1968

Year of admission	Place of referral: Texas	California	New York City	Louisiana	Florida	Puerto Rico	Hawaii	All other	Total
1949	14	9	5	3	1	0	0	5	37
1950-54	56	36	14	12	8	5	4	60	195
1955-59	45	25	12	12	7	4	1	31	137
1960-64	58	58	15	11	12	24	1	42	221
1965-68	67	20	3	10	19	7	2	37	165
1949-1968	240	148	49	48	47	40	8	175	755

Table 26

First admissions of patients with leprosy to Carville by place of birth
1949-1968

Place of birth	Year of admission: 1949	1950-1954	1955-1959	1960-1964	1965-1968	1949-1968
Texas	12	43	34	44	41	174
Puerto Rico	5	16	10	33	9	73
Louisiana	3	11	12	14	13	53
Florida	1	7	4	5	3	20
Hawaii	1	7	2	6	3	19
California	2	5	1	3	0	11
New York	0	2	0	0	1	3
Other USA	4	25	20	22	12	83
Mexico	3	28	19	41	36	127
Caribbean	0	29	4	13	18	64
Pacific	3	7	11	22	14	57
Asia	1	5	10	7	6	29
Europe	2	6	6	2	2	18
South America	0	2	4	5	6	17
Africa	0	1	0	4	0	5
Canada	0	1	0	0	0	1
Australia	0	0	0	0	1	1
Total	37	195	137	221	165	755

The majority of the patients admitted have lepromatous and/or dimorphous leprosy. Because outpatient facilities are often utilized for the treatment and follow-up of patients with tuberculoid leprosy, patients with tuberculoid leprosy are often not referred to the hospital, a circumstance which makes it difficult to evaluate hospital statistics on the frequency of tuberculoid and lepromatous leprosy (Table 27).

First admission of patients with leprosy to Carville by type of illness
1949-1968

Type	1949		1950-54		1955-59		1960-64		1965-68		1949-1968		
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Total
Lepromatous	20	13	104	43	74	39	105	50	72	31	375	176	551
Dimorphous	0	0	0	0	0	0	24	12	19	23	43	35	78
Tuberculoid	2	2	32	15	16	8	16	9	9	7	75	41	116
Indeterminate	0	0	1	0	0	0	3	2	2	2	6	4	10
Total	22	15	137	58	90	47	148	73	102	63	499	256	755

Figures concerning the time from clinical onset to diagnosis are relatively unreliable since the onset is often not clearly defined. However, using information from Carville records, there has been little or no decrease in the length of time from onset to diagnosis during the last 20 years (Table 28).

Table 28

First admissions of patients with leprosy to Carville
1949-1968

Interval in years from onset to diagnosis (percentage in each interval)

Year of admission	>1	1-4	5-14	15 +
1949	17	51	28	3
1950-54	20	52	23	4
1955-59	28	40	28	3
1960-64	32	47	18	4
1965-68	29	41	25	3
1949-1968	27	46	23	5

From 1900 through 1968 there were 346 Negroes admitted to Carville or to the Louisiana Leprosy Home. Ninty-one were born outside of the United States. Of 255 born in the country, 151 were born in Louisiana, 39 in Texas, 18 in Florida, and 47 in other parts of the United States (Table 29).

Table 29

First admissions of patients with leprosy to Carville

Negro race--Admitted and reported cases
1900-1968

Place of birth	Year of admission 1900-19	1920-39	1940-68	Total
Alabama	1	0	2	3
California	0	0	1	1
Florida	1	10	7	18
Georgia	1	5	4	10
Indiana	0	0	1	1
Louisiana	38	71	42	151
Maryland	0	0	1	1
Mississippi	2	4	3	9
Missouri	1	0	0	1
New York	0	1	0	1
North Carolina	1	0	1	2
Pennsylvania	0	1	1	2
South Carolina	0	11	2	13
Tennessee	0	0	1	1
Texas	2	16	21	39
Virginia	1	1	0	2
Total number born in U.S.	48	120	87	255
Place of birth				
Cuba	0	1	3	4
Puerto Rico	0	1	13	14
Virgin Islands	0	5	24	29
Other foreign countries	1	24	19	44
Total number born out of U.S.	1	31	59	91
Total cases	49	151	146	346

Of 53 Negro patients admitted after 1949, 31 (58 percent) had lepromatous leprosy (Table 30). Information concerning the diagnosis of cases prior to 1949 is either incomplete or in a form that cannot easily be compared to present diagnostic terminology. The frequency of lepromatous leprosy in this group of Negro patients is greater than would be expected on the basis of experience in Africa, where tuberculoid leprosy is often 90 percent of the total.[1]

Table 30

Negroes born in the United States, with leprosy diagnosed from 1949-1968

	Florida		Louisiana		Texas		Other		Total*	
Year	Lep.[a] and Dim.	Tub.[b] and Ind.	Lep. and Dim.	Tub. and Ind.	Lep. and Dim.	Tub. and Ind.	Lep. and Dim.	Tub. and Ind.	Lep. and Dim.	Tub. and Ind.
1949	0	1	0	0	1	0	0	0	1	1
1950-54	0	0	1	5	3	2	4	3	8	10
1955-59	0	0	5	1	1	1	2	1	8	3
1960-64	0	0	4	4	1	2	2	0	7	6
1965-68	0	0	3	0	3	0	1	2	7	2
1949-68	0	1	13	10	9	5	9	6	31	22

a. Lep. and Dim. = Lepromatous and Dimorphous
b. Tub. and Ind. = Tuberculoid and Indeterminate
* 2 cases with incomplete information

VI. LEPROSY IN VETERANS

One-hundred-eighty-seven persons who entered the United States military service after 1940 have developed leprosy diagnosed before 1968 (Dr. Merlin Brubaker, Director, Career Development Program in Global Community Health, Silver Spring, Maryland; Dr. Chapman Binford, Medical Director, Leonard Wood Memorial, Washington, D.C.; and Dr. John R. Trautman, Director, USPHS Hospital, Carville, Louisiana, unpublished). Forty-seven of 187 had known family contacts with leprosy; an additional 41 had not been overseas during their military service, and 18 had onset of leprosy within the first 2 years of military service, all of which were taken to indicate exposure to leprosy before entry into the military service. Of the remaining 81, 51 were born in areas where exposure prior to military service was possible, leaving 30 who were most probably exposed during military service (Table 31).

Twenty of the 30 patients had served in the Army, two in the Navy, three in the Air Force, and five in the Marines. Twenty-four of the 30 had entered the Armed Forces between the years 1941-1945. Sixteen of the patients had a diagnosis of lepromatous leprosy, 6 dimorphous leprosy, and 8 tuberculoid and indeterminate leprosy.

The shortest and longest interval from service overseas to clinical onset of illness was recorded for each patient (Figure 8). Three patients with prolonged service overseas (13, 20, and 25 years of service overseas) are not included in the analysis since the time of possible exposure was prolonged; the average duration of service for the remaining 27 patients was 2.4 years with a range from 1-4 years.

The average interval from service overseas to clinical onset was longer for lepromatous patients than for tuberculoid patients (Table 32). Although this can be interpreted as indicating a difference in incubation period for the two polar forms of the disease, it can also be the result of the absence of significant neurologic damage in the early stages of lepromatous leprosy; neurologic involvement leading to diagnosis is often present with tuberculoid leprosy.

1. Spickett, S. G. Genetics and the Epidemiology of Leprosy. Leprosy Reviews. 32:173-181, 1962.

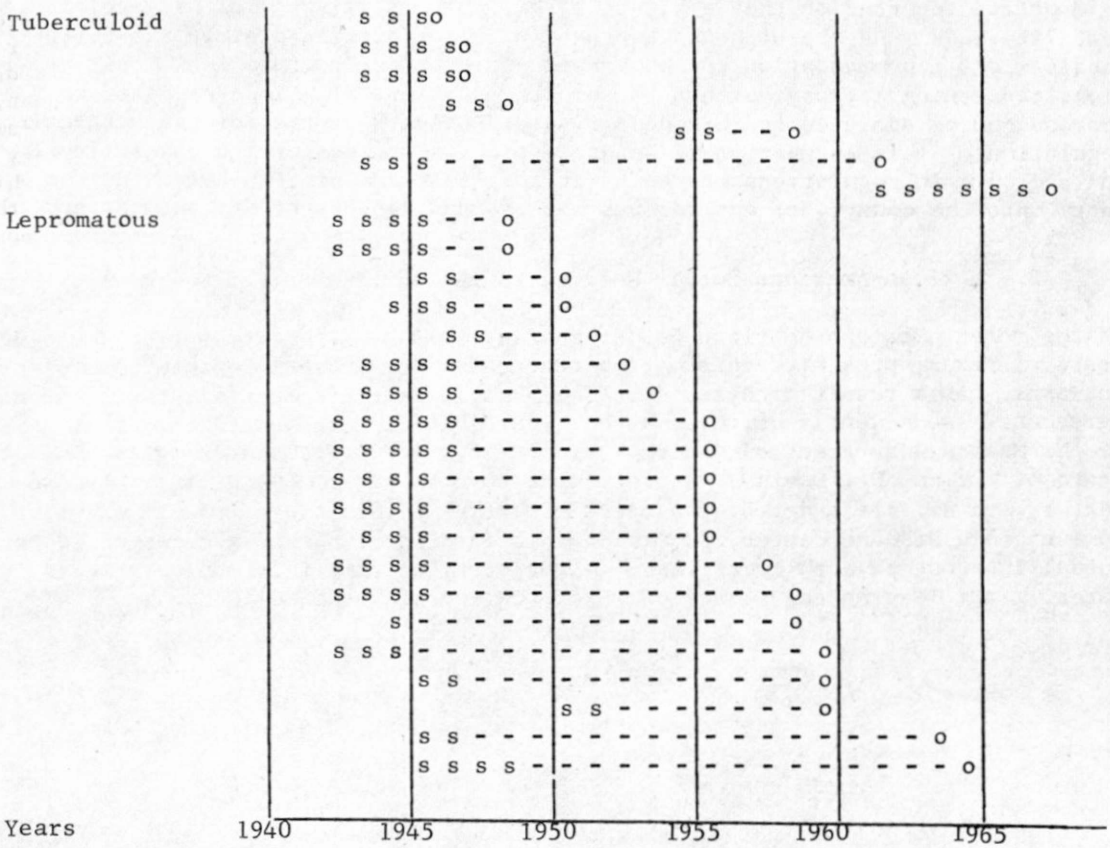
Table 31

Leprosy in veterans of the Armed Services entering service after 1940

Birthplace	Total	Known family contacts	No overseas military service	Onset within 2 years of entry into service	Possible exposure in service	Only probable exposure in service
California	4	1	3	0	0	0
Florida	11	7	2	1	1	0
Hawaii	6	2	0	2	2	0
Louisiana	25	12	6	0	7	0
Puerto Rico	10	1	1	3	5	0
Texas	41	12	12	3	14	0
Other U. S.	39	1	5	1	32	30
Foreign	51	11	12	8	20	0
Total	187	47	41	18	81	30

Figure 8

Veterans with most probable exposure to leprosy overseas
Interval from exposure to onset



S--years in service
O--year of onset

Table 32

Interval (years) from overseas service to clinical onset of leprosy in veterans with most probable exposure overseas

	Number	Short interval Average	Short interval Range	Long interval Average	Long interval Range
Lepromatous*	20	9.3	3-17	11.6	5-19
Tuberculoid**	7	2.9	0-16	5.3	2-18

* includes 6 dimorphous
**includes 4 indeterminate

VII. REPORTS ON MEETINGS

A. State and Territorial Epidemiologists, Atlanta, Georgia, April 1969

During the recent biennial meeting of the State and Territorial Epidemiologists, several resolutions concerning leprosy surveillance were presented for discussion and were subsequently approved. The text of the three resolutions approved the use of a Leprosy Surveillance Form for reporting cases to the National Communicable Disease Center. The proposed form is appended to this report. Also approved was the reporting of the number of new cases of leprosy on the weekly morbidity telegrams. Information reported on the weekly telegram may be published in the Morbidity and Mortality Weekly Report with the approval of the reporting state. The third resolution considered a recommendation to the Foreign Quarantine Program, NCDC, that the regulations concerning leprosy be changed so that a patient with indeterminate or tuberculoid leprosy can be admitted to this country under Class B of the Foreign Quarantine Regulations. This suggestion is being considered by the Foreign Quarantine Program and a change in regulations may be effected. The present regulations do not allow entry into the country of any persons who has had leprosy of any form at any time.

B. Mexican-American Border Meeting, June 1969, Santa Fe, New Mexico

At the recent Mexican-American Border Meeting, Dr. M. S. Dickerson, Epidemiologist, State of Texas, presented information concerning the present leprosy control program in Texas. As a result of discussions held following this meeting, there was an agreement, subsequently approved by Dr. Pedro Daniel Martinez, Subsecretary of Health of the Mexico Department of Health, Dr. Jorgé Vilchis Villasenor, Epidemiologist, State of Mexico, Dr. David J. Sencer, Director, National Communicable Disease Center, and Dr. Alexander D. Langmuir, Director, Epidemiology Program, National Communicable Disease Center, to exchange information concerning cases of leprosy of mutual interest to both countries. The majority of this information concerns persons entering and leaving the States of Texas, California, and Mexico.

VIII. LEPROSY SURVEILLANCE FORM

MEDICAL RECORD. This form contains medical information the disclosure or release of which is restricted by 5 U.S.C. 552, (b) (6); 45 CFR Part 5.

BUDGET BUREAU APPROVAL PENDING

CASE NUMBER

SOCIAL SECURITY NUMBER

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
HEALTH SERVICES AND MENTAL HEALTH ADMINISTRATION
NATIONAL COMMUNICABLE DISEASE CENTER
EPIDEMIOLOGY PROGRAM
ATLANTA, GEORGIA 30333

LEPROSY SURVEILLANCE

HEALTH JURISDICTION

☐ CASE REPORTED WEEK ENDING ____ 19__
☐ CASE NOT REPORTED
☐ CASE TRANSFERRED FROM ____

Patient's Name — Last First Middle

Sex ☐ Male ☐ Female

Aliases

Race or Ethnic Group ☐ White ☐ Negro ☐ Other

Maiden Name (if married)

Present Address Street or R.F.D. No. City or Town County State

Occupation

Usual Address (if different from above) Street or R.F.D. No. City or Town County State

Date of Birth

Place of Birth County State Country

Date Entered State

From Where

Date Entered U.S.

From Where

Citizen of

Residence in USA, or Other Countries, Starting from Present (Including Places of Military Service)

	TOWN	COUNTY	STATE	COUNTRY	Inclusive Dates From Month/Year	Inclusive Dates To Month/Year
1.						
2.						
3.						
4.						
5.						
6.						

Date of Onset

Date doctor first seen for symptoms of leprosy

Date leprosy first diagnosed

Describe Onset

If Therapy Prior to Diagnosis of Leprosy, Drugs(s) Prescribed, Dosages, Dates

Type of Leprosy ☐ Lepromatous ☐ Tuberculoid ☐ Dimorphous or Borderline ☐ Indeterminate

Referring Physician

Biopsy Performed (If yes, by whom, date and site)

☐ Yes ☐ No

Acid-Fast Stain of Smear or Section Date

☐ Yes ☐ No

If yes, bacilli seen ☐ Yes ☐ No

Disability and/or Deformity

	Eyes	Hands	Feet	Other
Mild	☐	☐	☐	☐
Severe	☐	☐	☐	☐

Current Therapy
Drug(s)
Dosage(s)

Date Started

Is Patient Hospitalized (if yes, give name of hospital)

☐ Yes ☐ No

Hospital Number

Date

If Not Admitted to Hospital, Name and Address of Physician

Investigated by

I List all LIVING family members who have had a month or more of household contact with the patient. Include members who are not presently in the patient's household but who had such contact in the past. Start with grandparents (paternal and maternal), parents, spouse, brothers, sisters (use married names), and children. Also include other household contacts if any. Use second sheet if necessary.

Name*	Age		Relation to Patient	Full Address				Inclusive Dates of Contact	
	M	F		No.	Street	City	State	From Month/Year	To Month/Year
1 ☐									
2 ☐									
3 ☐									
4 ☐									
5 ☐									
6 ☐									
7 ☐									
8 ☐									
9 ☐									
10 ☐									
11 ☐									
12 ☐									
13 ☐									
14 ☐									
15 ☐									
16 ☐									
17 ☐									
18 ☐									
19 ☐									

*Check box if known or suspected case of leprosy.

II Possible Source: List all known or suspected cases of leprosy in persons (other than those above) who have had any contact with the patient. Note if deceased.

STATE EPIDEMIOLOGISTS AND STATE LABORATORY DIRECTORS

Key to all disease surveillance activities are the physicians who serve as State epidemiologists. They are responsible for collecting, interpreting, and transmitting data and epidemiological information from their individual States; their contributions to this report are gratefully acknowledged. In addition, valuable contributions are made by State Laboratory Directors; we are indebted to them for their valuable support.

STATE	STATE EPIDEMIOLOGIST	STATE LABORATORY DIRECTOR
Alabama	Frederick S. Wolf, M.D.	Thomas S. Hosty, Ph.D.
Alaska	Donald K. Freedman, M.D.	Ralph B. Williams, Dr.P.H.
Arizona	Philip M. Hotchkiss, D.V.M.	H. Gilbert Crecelius, Ph.D.
Arkansas	J. T. Herron, M.D.	Robert T. Howell, Dr.P.H.
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Florida	E. Charlton Prather, M.D.	Nathan J. Schneider, Ph.D.
Georgia	John E. McCroan, Ph.D.	Earl E. Long, M.S.
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Mississippi	Durward L. Blakey, M.D.	R. H. Andrews, M.S.
Missouri	E. A. Belden, M.D.	Elmer Spurrier, Dr.P.H.
Montana	Mary E. Soules, M.D.	David B. Lackman, Ph.D.
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South Dakota	G. J. Van Heuvelen, M.D.	B. E. Diamond, M.S.
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Washington	Byron J. Francis, M.D.	W. R. Giedt, M.D.
West Virginia	N. H. Dyer, M.D.	J. Roy Monroe, Ph.D.
Wisconsin	H. Grant Skinner, M.D.	S. L. Inhorn, M.D.
Wyoming	Herman S. Parish, M.D.	Donald T. Lee, Dr.P.H.