

# Leprosy in Puerto Rico, 1900-1930

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## Abstract

To describe epidemiologic characteristics of Hansen's disease cases in Puerto Rico, information was abstracted from records of 107 patients reported on the 1910, 1920 and 1930 US census. Average annual incidence rates ranged from 1.09 to 4.76 cases per 1,000 persons. A majority of the patients were male (63%) and white (77%). Nearly all of the patients were born in the Puerto Rico.

## BACKGROUND

Leprosy was an important public health problem in Puerto Rico during the early 20th century (1,2,3,4). No one knows when leprosy entered Puerto Rico. Some historians have traced the existence of leprosy in Puerto Rico to the arrival of slaves from Africa in the eighteenth century. Or Spaniards brought it alongside with syphilis, typhoid and smallpox. Friar Iñigo Abad y Lasierra wrote a historical survey of Puerto Rico in 1788 where he described the presence of leprosy inhabitants on the island (5).

An 1812 report from the town council of San Juan indicates that for the township provided a small monetary allowance for a person with leprosy with the intention of removing the indigent person from its streets (5, 6). In 1876, the city council of San Juan built a maritime quarantine station at Isla de Cabras, a small island on the west side of the Bay of San Juan. Leprosy was among the contagious diseases quarantined at this facility (6).

This was only a temporary solution and in 1880, the San Juan city council built a one-story wooden building with room for six patients behind the city jail that housed vagrant person with leprosy. Located in the part of San Juan called Puerta de Tierra the detention center was surrounded by a slum of small wooden huts (7).

For most of recorded history, persons with leprosy were rounded up and put "out of the camp" in biblical fashion, isolated far from their families and friends in hospitals known as lazarettos. This ancient protocol for leprosy is named after Lazarus, the leprosy beggar in the biblical parable.

For centuries on, given the dearth of scientific knowledge, people continued to wrap leprosy in religious mystery and interpreted its hideous effects as God's punishment. The leprosy bacillus was not detected until 1873, when it was first noted by Norwegian physician, Gerhard Hansen. Leprosy is now referred to as "Hansen's disease".

The man who put leprosy on the 19th-century stage, however was Father Damien, a Catholic priest from Belgium who lived and died at the leprosy settlement on Molokai, Hawaii (8). His energetic pursuit of reform turned him into a worldwide celebrity, his exploits rehearsed in several hagiographic accounts. Father Damien's death in 1889, inevitably from leprosy, coincided with the publication of a book by a British rector entitled *Leprosy: An Imperial Danger* (9), a text that focused attention on the apparent threat to the British empire and led to the passing of the Lepers Act 1898, that reinforced segregation.

The popular obsession with leprosy was indeed a phenomenon of the imperial age. The colonial authorities grew concerned when they realized that the disease affected white people as well as the natives. The imperial solution was to find some out-of-the-way island to which the sufferers could be sent, voluntarily or through coercion. Molokai was one, as was the small island of Culion in the Philippines and Robben Island off Cape Town. For Puerto Rico, it was Isla de Cabras.

When the US became a colonial power as a result of the Spanish-American War and gained control of Puerto Rico, the military government channeled its resources into the surveillance and mitigation of disease that were threats to its troops (10). In 1898, Surgeon General George Sternberg

called for the creation of committees to monitor diseases that threatened troops and hindered the effort to democratize and restructure the territories. Military authorities conducted a census in Puerto Rico and identified 60 cases of leprosy out of a population of 953,243; of these 11 leprosy cases were isolated in San Juan (11).

The inadequacy of the San Juan facility was immediate apparent to the Military Government. However, before any action could be taken Hurricane San Ciriaco destroyed the facility in August 1899. The patients were moved to the basement of the city jail that served as a temporary structure until health officers could select another site.

The exigencies brought by the hurricane helped to shape the public health agenda. The Governor explained why leprosy patients were highlighted for intervention: "In regard to the lepers, whose disease renders them a menace to public health, not only compassion for their suffering, but also security for the sound inhabitants, requires their isolation and consequent support and relief." After agreement on the needed repairs and the financing of these projects on 21 August 1900, plans were announced to remove the detained leprosy patients from San Juan to Isla de Cabras. By 17 October 1900, all patients in San Juan had been relocated to the new leprosarium on Isla de Cabras.

Isla de Cabras contained the geographical elements of an isolation point. The island was 1.6 km in length and about 1.3 km wide. A natural barrier of rocks and rough surf made the northern and southern side facing San Juan unapproachable by boat. Most of the island's buildings were constructed of brick and cement and it included a disinfection facility, a large wooden warehouse, a dispensary and a manager's lodge. The main isolation ward was divided into two bays. At one end of the room was a small kitchen equipped for a charcoal fire and cement laundry basins. A cemetery and wooden picket fence separated this quarantine facility from the rest of the island.

During its first decade the facility at Isla de Cabras spiraled into an uninhabitable state. Isla de Cabras lacked fundamental elements of proper hygiene. Water leaked from the roofs into the patients living quarters. The cistern, the only supply of water, often failed to provide potable water. The concrete floors retained moisture making it difficult to keep clean and prevent further infection of lesions.

Because the public health measures required patients to live there involuntarily, Director of Health, Dr. Manuel Quevedo

Baéz, recommended that improved living conditions at the leprosarium were necessary to fulfill the standards that the Board of Health had set for general sanitation.

In 1910, a government committee found 25 patients with leprosy at Isla de Cabras from a general population of Puerto Rico at approximately 1,118,012. In 1915, the Public Health Service reported there were, 37 lepers in Puerto Rico.

Two hurricanes that struck the island on 22 and 29 August 1916 left the leprosarium in ruins and "practically uninhabitable" as described by the Director of the Board of Public Buildings in his, 'Memoir on Repairs to Leper Colony, Goat Island' (3). However, there was little discussion among the Governor and his Committees about re-mediating the situation.

In 1919, Act 76, enacted into public law required the formation of a Board of the Leper Asylum to establish a new leprosarium. The island's Legislative Assembly expected that the new leprosarium "[should] not constitute a nuisance" (3).

The principle of isolation that dominated treatment since biblical days was altered in 1923 at the Third International Leprosy Congress. While the Leprosy Congress continued to recommend hospital isolation, the option of isolation at home was now allowed (12). These guideline changes were most dramatic in the recommendations for countries where leprosy was endemic. Isolation was to be as humane as possible, but among indigent populations isolation at a hospital or leprosarium continued to be deemed the most efficient and effective method.

With new standards of acceptable and effective treatment for the practice of leprosy control, the island's legislature passed a law in 1925 that provided funds for the colony at Isla de Cabras colony to move to a new site at Trujillo Alto. The site selected was a forty-acre plot situated 22 kilometers south of San Juan. The institution fit for sixty patients was spread out over fifteen acres and included a three-story administrative building, conference space, a dining room, clinical and surgical wards, and housing facilities. There were eight small houses for the patients, each with four beds and a bathroom.

Strict rules for the eventual release of patients with leprosy were passed in anticipation of the Trujillo Alto move. Under the new sanitary regulations, a patient would remain at the colony until he or she passed bacteriological specifications that indicated that the patient was no longer contagious and a

threat to the community (13).

On 26 June 1926, 43 patients moved from Isla de Cabras to the new Insular Leper Colony. Commissioner of Health Pedro Ortíz, anticipated that the spacious and verdant landscape of Trujillo Alto “will no doubt improve the moral and physical condition of the inmates” (14). In 1977, after servicing patients for 51 years the Leprosarium in Trujillo Alto closed.

**METHODS**

This study draws on the decennial census conducted by the US Census Bureau in 1910, 1920 and 1930. The data collected remained nearly consistent from decade to decade. In addition to basic population counts information on race, ancestry, gender and education are included.

Statistical analysis began with calculations of means and standard deviations of all responses using the Epi Info 7.0 software program. Mean responses were subjected to analysis of variance; the a priori level of significance was set at  $p < 0.01$ .

**RESULTS**

**POPULATION**

The 1910, 1920 and 1930 US censuses recorded 107 persons with leprosy residing at the leprosarium. Of this total, three individuals were found on the 1910 and 1920 census, 10 individuals were included in both the 1920 and 1930 count and one patient was included in all three.

In 1910, the Isla de Cabras leprosarium housed 20 patients with leprosy and a staff of 14. In 1920, 37 patients and a staff of 15 were counted. The 1930 census listed 50 persons with leprosy and a staff of 29 that included the warden and his family, cooks, counselors and other employees at the Leprosarium in Trujillo Alto.

**Figure 1**

Table 1: Population and Leprosy Patients in Puerto Rico, 1899 – 1930

Year	Population	Patients
1899	953,243	N/A
1910	1,118,012	20
1920	1,299,809	37
1930	1,543,913	50

Statistical data indicate that in 1899 Puerto Rico was

predominantly rural with only 14.6% of its population classified as urban. According to the 1899 census, only 17 localities were classified as urban (2,500 inhabitants or more) and none of these had 50,000 inhabitants or more. Throughout the 20<sup>th</sup> century, the island population became increasingly urban. Census data however, does not allow us to determine the city of origin of those hospitalized for leprosy.

**Figure 2**

Table 2: Urban and Rural Population in Puerto Rico, 1899 – 1930

Year	Urban	Percent Urban	Rural	Total
1899	138,703	14.6	814,540	953,243
1910	224,620	20.1	893,392	1,118,012
1920	283,934	21.8	1,015,875	1,299,809
1930	427,221	27.7	1,116,692	1,543,913

In research conducted for his doctoral dissertation in 1926 Father Palacios found that the majority of leprosy cases on the island were from Naguabo, Patillas, Vega Baja, Ponce, Fajardo, Arecibo and Guayama. Excluding Ponce all of these municipalities were considered rural in the 1930 census (1, 15, 16).

Sex. Most patients were male (66.4%); 33.6% were female. In 1910, 75.0% were male and 25% female; in 1920, 67.6% of patients with leprosy were male and 32.4% female; by 1930, the male population had decrease slightly to 66.4%; with women accounting for 33.6% of the patient population. The sex ratio is the ratio of males to females in a given population. Among patients with leprosy, there were 194 males per 100 females.

Age. The majority of Puerto Ricans were young. The median age for the island's population was 18.3 and nearly 90% of the population was under the age of 64. However, the population distribution was much different for patients. As can be seen in Table 3, about 5% of the patients were between the ages of 2 and 14; 44.5% were 15 to 64 years of age and 3.3% were over 65 years of age. The mean age for all patients was 34.

The youngest person listed was Eleuterio Bonay y Gonzalez, a 9 year old male and the eldest Zoilo Camacho Rosario a 74 old male. The mode was 25. The mean age among the 1910 patient cohort was 36.1 and ranged from 13 to 50. The mean age among the 1920 patient cohort was 35.5 and ranged from 9 to 74. The mean age in 1930 among patients was 32.2 and ranged from 11 to 65.

**Figure 3**

Table 3: Population Distribution by Broad Age Groups, Puerto Rico: 1899 – 1930

Year	Median Age		<15		15-64		65+	
	Population	Patients	Population	Patients	Population	Patients	Population	Patients
1899	18.1	N/A	43.9	N/A	44.3	N/A	2.0	N/A
1910	18.5	34.5	42.9	9.5	45.1	90.5	2.3	0
1920	18.4	35.4	43.3	2.7	43.6	89.2	2.3	8.1
1930	18.3	31.9	42.1	2.0	45.0	95.9	2.6	2.0

Race. The majority of Puerto Ricans are of mixed racial and ethnic origins (17). Spanish conquistadors who came to the island in the 16th century virtually decimated the native Taino Indian population. At the end of the 18th century, only about 2,000 remained and subsequent censuses failed to list any (18).

By the early 20th century, most inhabitants were largely descendants of the Spanish settlers, former African slaves, with some slight Indian mixture. From the earliest times, there was considerable intermarriage among blacks and whites. After slavery was abolished in 1873, blacks obtained legal and political equality. Rogler (19) has observed that over time there has been a strong tendency to define light mulattoes as white. This is borne out by census data: in 1860, 48.5% of the population was classified as nonwhite; in 1887, 40.5%; in 1910, 34.5%; by 1930, 25.7%.

Patients with leprosy were categorized racially as either white or black, mulato or colored depending on the year the census was conducted. The 1910 and 1920 census classified patients as mulato and black as well as white. In 1910 three patients were classified as black, 6 as mulato and 11 white. In 1920 there were 12 black, 3 mulato and 22 white. In the 1930 census patients classified previously as mulato and black were now categorized as colored (22) and white (28). This was the case of Felipe Cecilio y Trujillo, Jesus Fuentes y Velez, and Juan Luciano Garcia y Pica, all who were enumerated as black on the 1920 census schedule and colored on the 1930. Two persons were listed on the 1910 and 1920 schedules as black. Eight persons were listed as white on multiple census. Jacinto Maldonado y Morales the only person on all three censuses was listed as mulato in 1910; subsequently he was listed as white.

In his 1926 census Palacios enumerated 37 patients that appeared on either the 1920 or the 1920 census (or both). Palacios used four racial categorize to classify patients: White, color (Black), mulato and trigueño (wheat-colored). Nearly all patients (97%) in Palacios study with the latter three classifications were categorized as black on the US Census.

To facilitate analysis by race, patients classified as color or mulato were recoded as black. The majority of patients with leprosy were white. Overall 57% of the patients were white and 43% black. Patients with leprosy were more evenly divided in 1910 (45.0 black; 55.0% white); by 1920, however, the white patient cohort peaked at 59.5% and decreased slightly to 57.1% in 1930.

Marital Structure. The marital structure of the Puerto Rican population changed significantly after 1899. The percentage of single persons decreased greatly, and the married population increased. These changes have been different for females and for males. By 1930, approximately 25% of the total female population over 14 years of age were single and 59% were married. For males, the proportions were 31% and 63% respectively. The proportion of persons that are widowed, on the other hand, consistently decreased since 1899 due in part to the decline in mortality levels. Divorce, although not allowed during the Spanish regime, increased significantly during the 20<sup>th</sup> century. It must be added that common-law marriage relationship was common until the mid-20th century.

Among patients with leprosy 11.2% were married; 4.7% were widowed and the remaining 84.1% were single. For 1910 (15.0%) and 1920 (13.5), these percentages were slightly above average for married patients. In 1930, the married population dropped to 8.0%. No persons were listed as widowed on the 1910 census; in 1920 a 74 year old male was listed as widowed. In the 1930 census four women between the ages of 31 and 50 were listed as widowed. No patients were divorced.

The 1910 census also asked patients that were married how long they had been married. The average length married was 18.6 years and the range was 8 to 28.

Literacy. Up to the end of the 19th century, the majority of the Puerto Rican population was illiterate. Data from the 1887 census indicate that only 14% of the total population (5 years or more) could read and write. Only 7% of the population aged 5-19 years attended school, and of these, women comprised 58%. Since 1899, the proportion of illiterates on the island has decreased significantly, with the greatest changes occurring during the first decade of the 20<sup>th</sup> century.

The 1910 and 1920 census asked if the patient could read and write as two distinct questions. In 1930 the question was combined as one. The majority of patients were able to read

and write (56.6). Among males, 66.7% and 61.0% of females were literate. Nearly 80% of all patients between the ages of 11 and 40 were literate. Only 21.2% of patients over the age of 41 could read and write.

Black patients (65.2) were slightly more likely to read and write than white patients (59.0%). The percentage of the patient population that could read and write increased with each census. In 1910 only 38.1% were literate; this increased 170% by the 1920 census. By 1930 nearly 70% of patients with leprosy could read and write.

**Morbidity.** We do not know when patients in the leprosarium were first diagnosed with leprosy. Leprosy is decidedly contagious and endemic. The epidemiology of leprosy appears to present several problems concerning its infectiousness and mode of transmission. In whatever way a person does become infected, the disease is not likely to reveal itself for some years. The incubation period has not been determined accurately, but the intervals proposed range between three and five years. Roger and Muir<sup>(20)</sup> state that the period of latency can be from six months to twenty years and that the average period of incubation is about three and one-half years.

The average incidence rate for leprosy for 1900-1930 varied from 1.09 to 4.76 per 1,000 persons per year. Doull<sup>(21)</sup> writes that “[o]n June 30th, 1902 there were 17 patients, 10 males and 7 females, isolated on this island [Isla de Cabras]. No records could be found for the intervening years but on June 30th. [stet], 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 29, 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. [stet], 1940 being 45.”

According to Dr. Pedro N. Ortiz<sup>(22)</sup>, in an article published in 1923 on chaulmoogra oil, a fatty oil expressed from the seeds of *Taraktogenos Kurzii*, 102 lepers were admitted to Isla de Cabras between 1900 to 1923. Discounting the original ten patients transferred in 1900, 92 patients were admitted over the twenty three year period or an average of 4 patients per year. This compares with 202 patients admitted to the colony Trujillo Alto facility between 1 July 1926 and 30 June 1950, a period of 24 years. Discounting the 43 patients transferred from Isla de Cabras at its opening and 5

cases discharged because they did not have leprosy, 154 patients were admitted during the 24 year period, or an average of 6.5 patients per year.

We do not know the total number of cases of leprosy that there are on the island between 1900 and 1930. A careful survey was never conducted. Judging from the number of cases admitted to Isla de Cabras since 1900 and from a general survey conducted between December 1926 and August 1927, by Father Gonzalo Palacios de Borao<sup>(1, 15, 16)</sup> that recorded 137 known and 60 segregated cases reached the conclusion that there between 200 and 400 cases, giving an approximate rate of 4.85 per 1,000.

**Mortality.** Mortality among the general population was high in Puerto Rico before the 20th century. Estimates by Vazquez<sup>(23)</sup> give a crude mortality rate of 40 deaths per 1,000 inhabitants for 1765, 33 deaths per 1,000 in 1818 and 34 deaths per 1,000 in the period 1895-1899. However, the decline in mortality was extremely slow and by the end of the 19th century, mortality levels in Puerto Rico were similar to those in Europe during the 18th century. Mortality rates also fluctuated abruptly because of hurricanes, epidemics and crop failures.

From the early 1900s to the end of the 1930s, mortality levels in Puerto Rico decreased slowly. The average death rate was 28 per 1,000 population in the period 1900-1904 and 19 per 1,000 for the period 1935-1939, a 32 percent reduction. At the same time, life expectancy increased from 33 years in 1903 to 46 years in 1940, an increase of more than 33 percent.

The average life expectancy of a person with leprosy is less than 10 years. We can compare mortality over a ten year period. Among those listed on the 1910 census only four patients were found on the 1920 schedule: Jose Lando y Rivera, 50; Mateo Lopez, 42; Isidoro Ramos Quinones, 35 and Jacinto Maldonado who is also enumerated on the 1930 schedule. Seven men and three women were identified on both the 1920 and 1930 schedules. It is thus estimated that 80% of patients with leprosy died between 1910 and 1920 and that 72.9% died between 1920 and 1930.

## DISCUSSION

During the early 20<sup>th</sup> century leprosy was decidedly contagious and endemic in Puerto Rico. A reliable estimate of the prevalence of leprosy is impossible from the data available at this time; nevertheless it is estimated that at one time there were a total of 400 cases on the island. From 1910

through 1930, the average annual incidence rate for Puerto Rico varied 1.09 to 4.76 cases per million population. This persistent endemic focus may be explained by a large population of genetically susceptible persons or an environmental exposure to *M. leprae* or both. Knowledge of the exposures could not be ascertained from existent data.

The incidence and demographic characteristics of leprosy in Puerto Rico have changed little over time. From 1910 through 1930, average annual incidence rates ranged from 1.09 to 4.76 cases per million population in Puerto Rico. These rates are similar to those reported during 1981 through 1989 (24). During this period, 75 new uses were diagnosed with an average of 8.3 cases per year. The yearly incidence was 1.9 cases per million which is significantly lower to the 4.6 per million found from 1976 to 1980 (25).

Annually the percentage of cases in males, approximately 66.4% and the percentage in African-Americans, approximately 43%, varied little between 1910 and 1930.

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