

TUBERCULOSIS MORTALITY IN PUERTO RICO SINCE 1950

In 1953 the writers reviewed the tuberculosis problem in Puerto Rico up to and including the year 1950 (*Am. Rev. Tuberc.*, 1953, 67, 132). The remarkable drop in tuberculosis mortality which had been observed during the previous seventeen years and the possible causes for such an improvement, which occurred in the face of great overcrowding and poverty and without the use of BCG vaccine, were analyzed. It would be interesting for those who read that paper to learn what has happened to the tuberculosis mortality in this island since 1950.

The decline of the tuberculosis mortality in Puerto Rico since 1931 is shown in figure 1. It will be seen from this graph that the rate of decrease became accelerated in 1948-1949 and that it was especially rapid between 1952 and 1953. While the tuberculosis mortality dropped 41 per cent in the fourteen years which lapsed between 1934 and 1948 (from 302.7 to 179.4 per 100,000 population), it has decreased 74 per cent in the interval of five years from 1948 to 1953 (from 179.4 to 47.1).

Another interesting change is to be found in the proportion of tuberculosis deaths in relation to the total number of deaths. In the years from 1930 to 1950, such a proportion fluctuated between 13 and 16 per cent. In 1951 it began to decline and, in 1953, only 5.8 per cent of all the deaths which occurred on the island were due to tuberculosis (table 1). This brings down tuberculosis from its exalted position as "captain of death" (sharing honors with the syndrome "diarrhea and enteritis") to the fifth place among the causes of death in the island. For the first time in the history of Puerto Rico, diseases of the heart became the first cause of death, with diarrhea and enteritis in the second place, and cancer in the third. Fourth place was taken by the pneumonias. The degenerative diseases are now beginning to assume a predominant role in our mortality statistics (table 2).

Provisional figures for the first semester of the year 1954 show a tuberculosis death rate of 40, as compared with 51.4 during the corresponding semester of 1953. This is a clear indication that the decline is continuing at a fast pace.

What is the cause of this unprecedented decline in tuberculosis mortality? It is true that social conditions have improved considerably in Puerto Rico since 1940. Housing is better, wages are higher, and the net income per person has increased from \$122 per year in 1940 to \$399 in 1952 (\$207 in 1940 prices). Slums are still plentiful, however, and the standard of living for the majority of the people is much below what is considered satisfactory for healthy living.

In the previous article it was concluded that the descent of the tuberculosis mortality curve in the island was mainly due to three factors: the intense and efficient campaign against the disease which started in 1934, improved social and hygienic conditions, and chemotherapy. The writers now believe that chemotherapy has been the decisive factor in the remarkable decrease of the mortality which has come about since 1948, and especially since 1952. In 1948 the Health Department began to distribute streptomycin and PAS free of charge among all persons with active tuberculosis diagnosed in the public health units, excepting only those who were doing well with collapse therapy. PAS was given in doses of 12 gm. daily. Streptomycin injections were given in 1 gm. doses several times a week by the public health nurses in the dispensaries. As the great majority of the ambulatory tuberculous patients in the island go to the public health units for treatment, these drugs, used alone or in combination with collapse therapy, were responsible for the

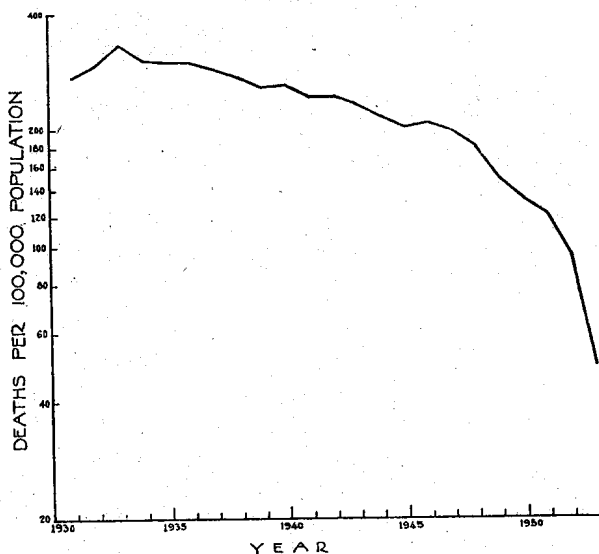


Fig. 1. Mortality from tuberculosis (all forms) in Puerto Rico for the period 1931-1953

TABLE 1

DEATHS AND DEATH RATES FROM ALL CAUSES AND FROM TUBERCULOSIS (ALL FORMS)
AND PER CENT OF ALL DEATHS ATTRIBUTED TO TUBERCULOSIS,
PUERTO RICO, 1946-1953

Year	All Causes		Tuberculosis		Per Cent of All Deaths Attributed to Tuberculosis
	Deaths	Rates	Deaths	Rates	
1946	27,570	13.2	4,317	207.3	15.7
1947	25,411	12.0	4,160	196.5	16.4
1948	26,204	12.2	3,858	179.4	14.7
1949	23,391	10.7	3,205	146.7	13.7
1950	21,917	9.9	2,861	128.9	13.1
1951	22,371	10.0	2,654	118.9	11.9
1952	20,504	9.2	2,092	93.4	10.2
1953	17,975	8.1	1,046	47.1	5.8

improvement or definite inactivation of the disease in a very considerable proportion of cases.

Since October, 1952, isoniazid has been used in combination with streptomycin in all persons diagnosed in the public health units as having tuberculosis. Treatments consist of 4 mg. of isoniazid daily per kg. of body weight and 1 gm. of streptomycin by intramuscular injection twice weekly. Until May, 1954, approximately eleven thousand cases of active tuberculosis were thus treated for periods of at least three months in the government dispensaries and hospitals. Many more were treated with similar regimens in the Veterans Administration contract hospitals and by private physicians throughout the island.

It is believed that this very extensive use of chemotherapy has been the decisive factor in the rapid decline of the tuberculosis mortality since 1948 and that it will probably lead

TABLE 2

THE SEVEN MAIN CAUSES OF DEATH IN PUERTO RICO, 1943 AND 1953

Year 1943			Year 1953		
Cause	Number of Deaths	Rate per 100,000 Population	Cause	Number of Deaths	Rate per 100,000 Population
Diarrhea and enteritis...	5,662	286.1	Diseases of the heart.....	2,405	108.3
Tuberculosis.....	4,573	231.1	Diarrhea and enteritis...	2,327	104.8
Pneumonias.....	2,415	122.0	Cancer.....	1,360	61.3
Diseases of the heart....	2,042	103.2	Pneumonias.....	1,056	47.6
Nephritis.....	1,599	80.8	Tuberculosis.....	1,046	47.1
Malaria.....	1,166	58.9	Accidents.....	622	28.0
Cancer.....	1,005	50.8	Nephritis.....	384	17.3

to further gains in coming years. Isoniazid, a cheap and effective drug, which is easy to distribute and easy to take, has been a tremendous help.

Although BCG vaccination has been given to some 57,000 children as part of a research project since October, 1949, it is believed that this measure has had little or no effect on the tuberculosis mortality. This is not only because the number vaccinated has been too small in proportion to the general population, but also because those vaccinated were mainly children of elementary school age, among whom tuberculosis is a comparatively unimportant cause of death.

The general mortality in the island has decreased from 9.9 deaths per 1,000 population in 1950, to a rate of 8.1 in 1953, a decrease of 18 per cent in three years. The drop in tuberculosis mortality has been much more dramatic: from a rate of 129.6 per 100,000 population to 47.1, a decrease of 64 per cent in the same short period of time.

It is interesting to compare the Puerto Rican experience with that of other communities of the United States which have likewise experienced an unprecedented decline in the tuberculosis mortality rate during the last few years. In Baltimore, according to the *Baltimore Health News* (January, 1954), the most prominent features in the vital statistics for 1953 were "a truly phenomenal decline of 31 per cent in Baltimore's tuberculosis death rate and an even more striking drop of 45 per cent in the city's Negro tuberculosis death rate as compared with 1952." This remarkable improvement is attributed mainly "to the effectiveness of streptomycin and other related drugs." In Puerto Rico, the tuberculosis mortality rate for 1953 dropped 49.5 per cent as compared with 1952.

In New York and other states an acceleration of the decline in tuberculosis mortality has been noted during the last few years. Similar observations have been made in some European countries. It seems we are now witnessing the final battle against the "White Plague."

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August 19, 1954