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EPIDEMIOLOGY OF TUBERCULOSIS IN PORTO RICO

I. MORTALITY STATISTICS AS RESPECTS RACE, AGE, SEX, ORGAN INVOLVEMENT AND URBAN OR RURAL RESIDENCE¹

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The object of this brief study is to bring out clearly a few of the more significant facts respecting the high incidence of tuberculosis in Porto Rico. The data on which the studies are based have been taken largely from the vital statistics of the Department of Health of Porto Rico, and we are greatly indebted to the Commissioner of Health, Dr. Pedro N. Ortiz, and his staff for helpful cooperation in compiling and interpreting the data.

The general tuberculosis death rate for Porto Rico and the death rate by each form of the disease together with the rate by sex, race and residence (urban or rural) have been computed. These have been compared with those of continental United States, several individual states, and other countries. The investigation has been limited to the four-year period, 1923-1927, since prior to 1923 our Porto Rico records were found incomplete, and for some years unobtainable. For comparative data we have drawn upon the mortality statistics for 1924 of the United States Census Bureau, and valuable information has been obtained from the reports of the Commissioner of Health of Porto Rico for 1924-25, and 1925-26; from the Sanitation Reports² of the Virgin Islands, 1921-25, and from a paper by Godias J. Drolet in the American Review of Tuberculosis, 1926, XIV, 620.

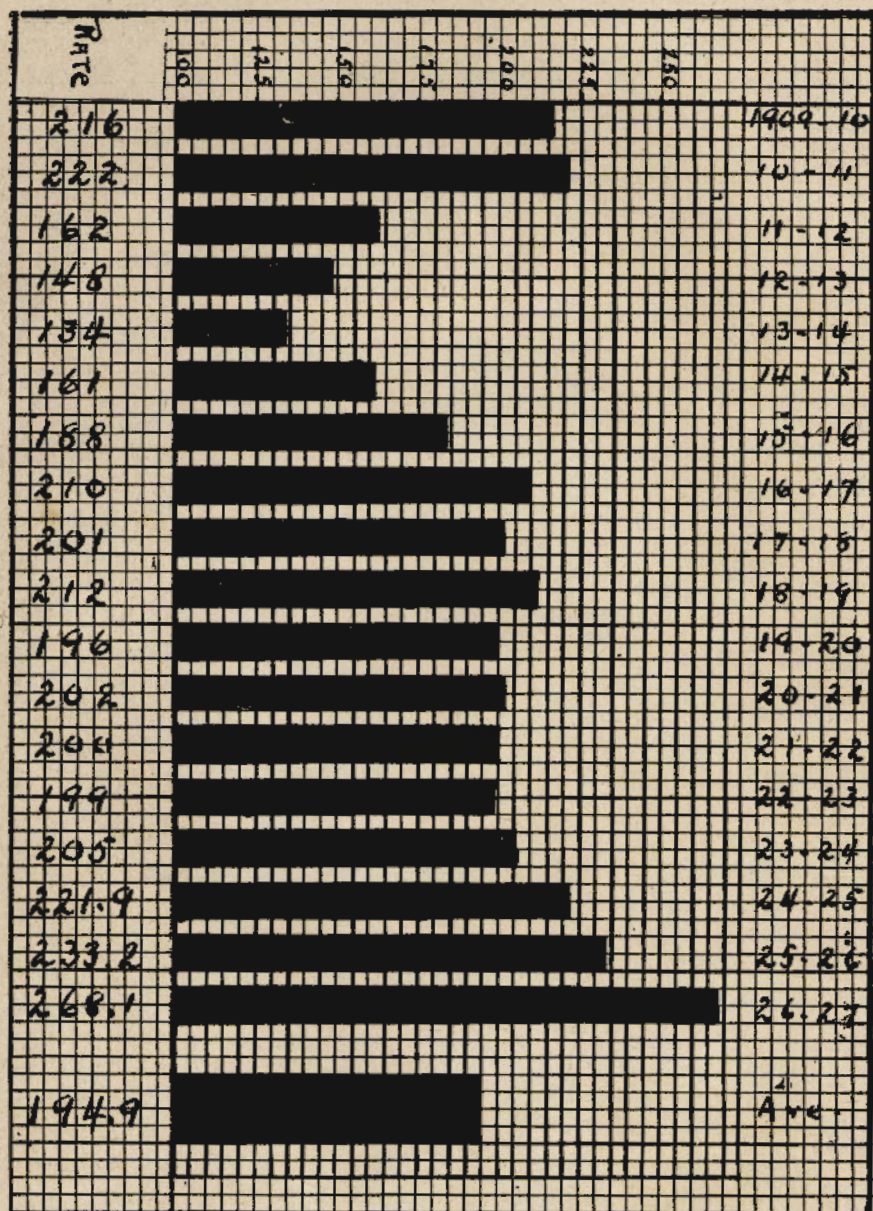
Some of the more significant findings have been arranged in tabular form and others have been presented in charts. All yearly figures for Porto Rico refer to the twelve-month period beginning July 1 and ending June 30. The population estimates are based

¹ One of a series of studies made under the direction of Dr. Haven Emerson in a course on "Public Health Problems" given at the School of Tropical Medicine in March, 1928.

² Detailed unpublished reports lent to the School of Tropical Medicine by the Governor of the Virgin Islands for this and other studies.

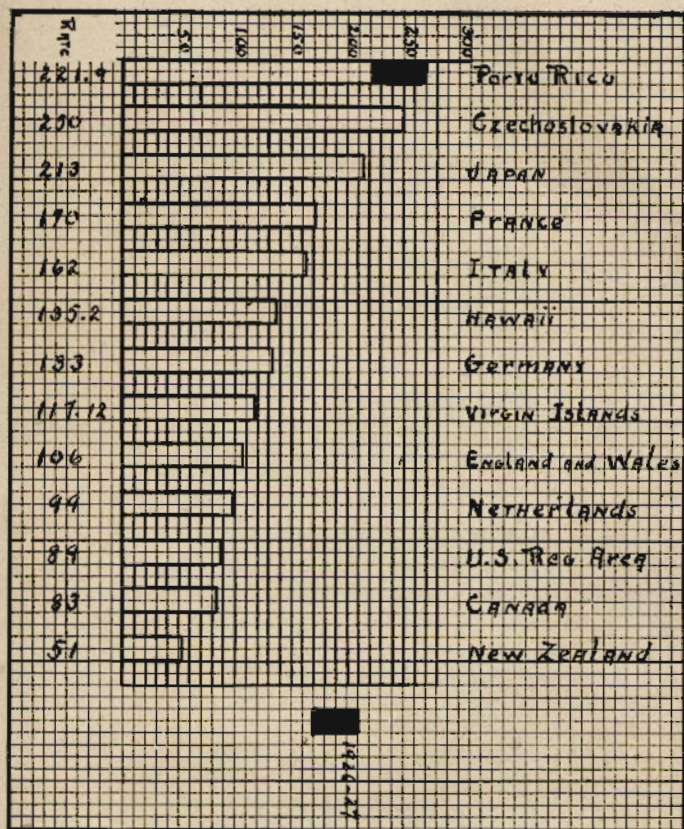
CHART I

Mortality from Tuberculosis in Porto Rico 1910-27



Note: The "rate" used in this chart signifies the number of deaths per 100,000 of population.

CHART II
Mortality From Tuberculosis (1924)



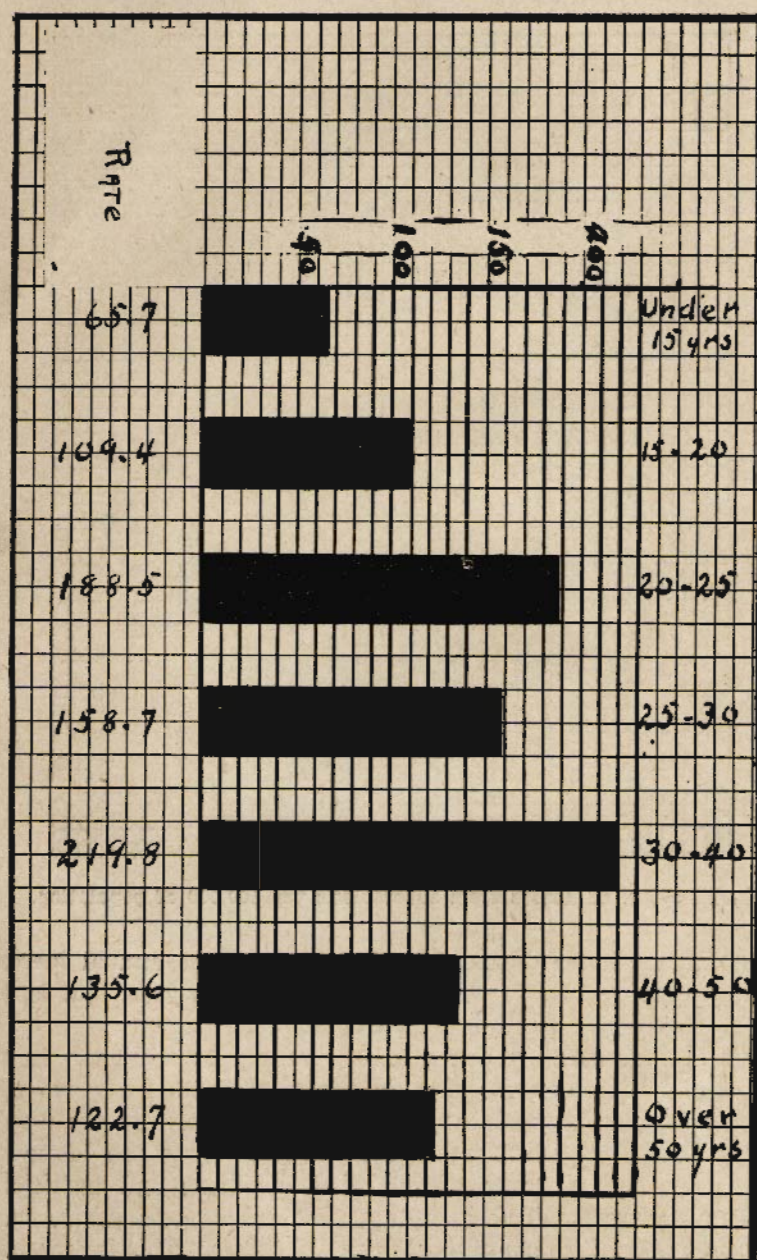
RATE = No. of deaths from tuberculosis per 100,000 of population.

on the United States Census for 1920, the average annual increase for the preceding 10-year period being added each year, that is, the usual arithmetical method has been employed.

Certain facts stand out prominently among the findings. In the first place it is seen that among the causes of death for Porto Rico tuberculosis holds second place, being exceeded only by the disease complex known as "diarrhea and enteritis". Since the latter obviously comprises a group of intestinal infections and nutritional disorders we are justified in saying that *tuberculosis causes more deaths in Porto Rico than any other single disease*. This is especially true for the adult population since "diarrhea and enteritis" take

CHART III

Death Rate From Tuberculosis in Porto Rico by Age Groups 1923-27



Note: The "rate" used in this chart signifies the number of deaths in each age group out of every 1,000 deaths from tuberculosis.

their victims early while tuberculosis draws its toll largely from men and women in the prime of life. For example, the largest number of deaths occurred in the age group, 20-30, the second largest in the 30-40 period, and the smallest in the group under 15. (See Table I and Chart III.) These figures eloquently emphasize the fact that tuberculosis is a double enemy of a country, in that, it not only takes life but takes it at the most productive period.

TABLE I

DEATH RATE FROM TUBERCULOSIS (ALL FORMS) BY AGE GROUPS

Rate = No. per thousand of total deaths due to tuberculosis

	Under 15 years	15-20	20-25	25-30	30-40	40-50	Over 50
1923-24.....	56.7	103.2	204.2	161.3	213.1	142.6	119.0
1924-25.....	64.0	114.8	192.3	162.7	214.1	130.7	120.9
1925-26.....	65.1	108.6	177.6	158.8	227.5	134.4	124.7
1926-27.....	72.7	111.3	180.1	152.1	224.8	134.9	126.4
Average.....	65.7	109.4	188.5	158.7	219.9	135.6	122.7

TABLE II

DEATH RATE FROM TUBERCULOSIS (ALL FORMS) BY SEX, RACE AND RESIDENCE (URBAN OR RURAL)

Rate = No. per hundred thousand living

	Males	Females	White	Colored	Urban	Rural	Total population
1923-24.....	185.0	225.8	186.4	269.0	418.2	125.2	205.5
1924-25.....	196.1	245.4	198.9	297.0	456.6	132.2	220.9
1925-26.....	215.4	263.4	213.6	328.2	515.2	136.3	233.2
1926-27.....	243.2	290.2	244.9	344.7	528.6	169.9	268.1
Average.....	209.9	256.2	210.9	309.7	479.6	149.9	231.9

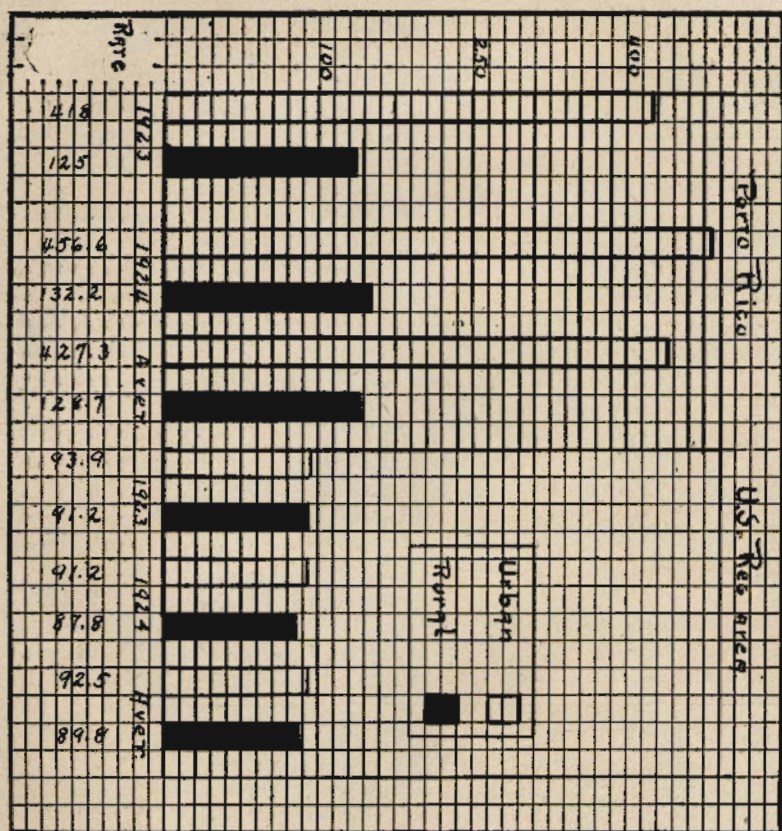
The tuberculosis mortality rate shows a steady increase during the past four years, and the increase affects all classes and ages, as is seen in Tables I and II and Chart I. The rate is twenty-two per cent higher for women than for men. It is also nearly fifty per cent higher among the colored race than in the white,¹ the rates being respectively 309.7 and 210.9. The urban population is more severely affected than the rural in the ratio of about 3.5 to 1. The death rate for the urban population is exceedingly high, averaging for 1924-27, 479.6 per 100,000. (See Chart IV.) These figures show

¹The race census estimates for 1924-27 are 1,081,745 white and 326,803 colored. The latter includes only negroes and mulattoes. The former undoubtedly includes a certain proportion of individuals with traces of negro or Indian blood.

that in Porto Rico tuberculosis is primarily a problem of the towns, and especially of the larger centers of population where there is much over-crowding among the poor, and where even those in better circumstances often sleep in small poorly ventilated quarters.

A comparison of the tuberculosis death rates of Porto Rico with

CHART IV
Mortality From Tuberculosis 1923 and 1924

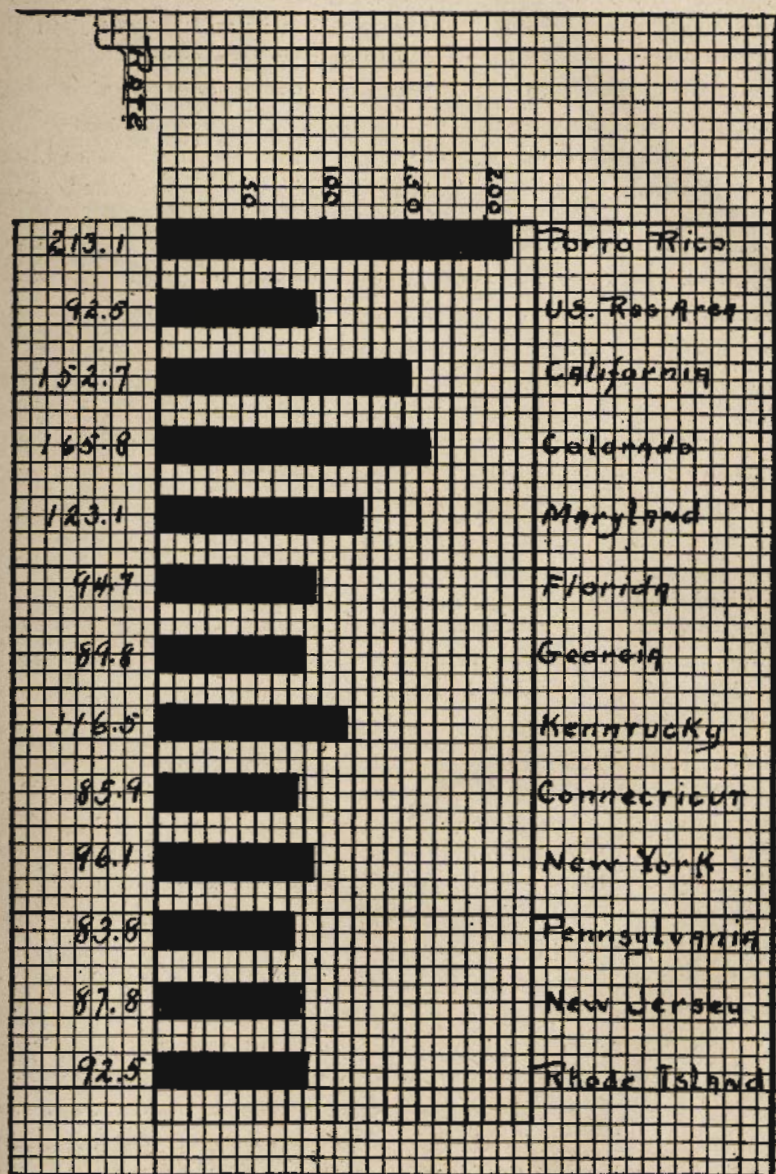


RATE = No. of deaths from tuberculosis per 100,000 of population.

those for the United States Registration area and several states of the Union, reveals significant differences. The death rate for Porto Rico is not only 130 per cent higher than that for United States Registration area, according to the figures for 1924, but is considerably above that of any eleven representative States, including Cali-

CHART V

Mortality From Tuberculosis 1923 and 1924



RATE = No. of deaths from tuberculosis per 100,000 of population.

ifornia, Colorado, Maryland, Florida, Georgia, Kentucky, Connecticut and New York. (See Chart V.) In all these states and in the United States Registration area there has been a steady decrease in rate since records have been available, while in Porto Rico the mortality from the infection is apparently increasing.

Chart II shows Porto Rico's standing with respect to tuberculosis as compared with various countries including France, Italy, Germany, England, Czecho-Slovakia, Canada, Japan, New Zealand, Hawaii, and the Virgin Islands. It is noted that in 1927 Porto Rico stood at the head of the list.

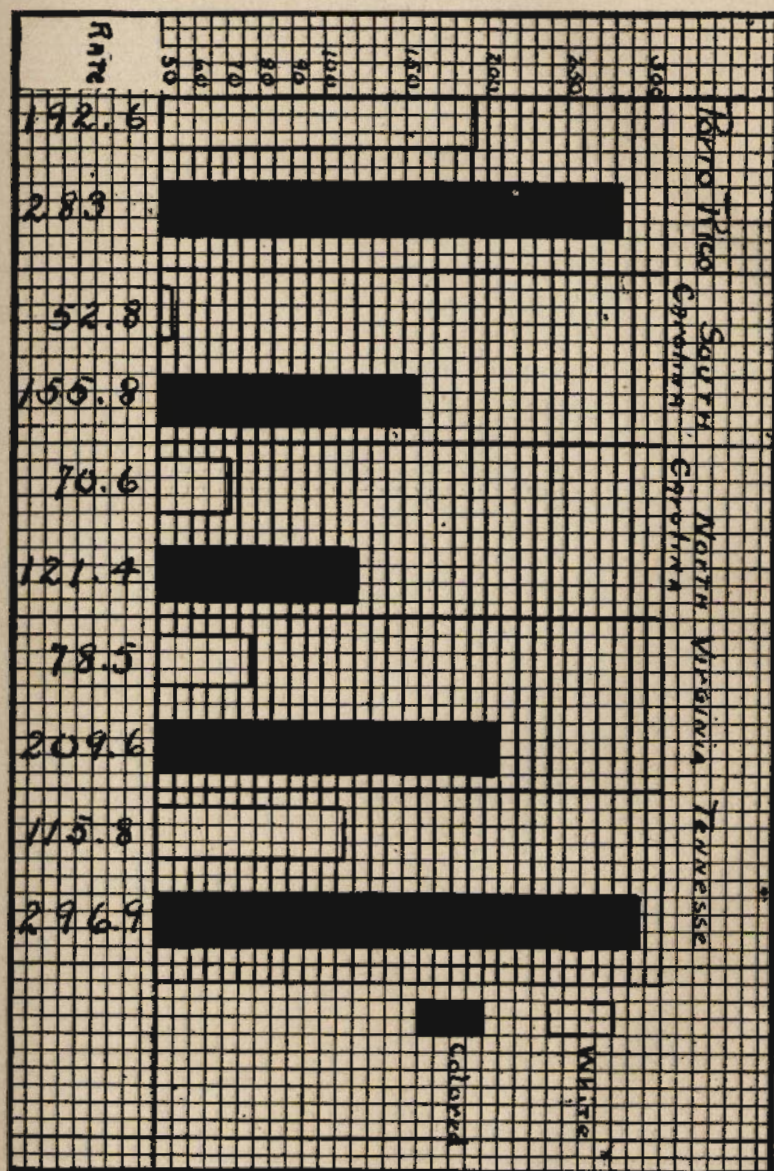
Comparison of the death rates among the white and colored populations of Porto Rico with those of four states of the Union having a large negro element (North Carolina, South Carolina, Virginia and Tennessee) brings out the fact that the rate here for the white population is considerably above that of any of the four states while the rate for the colored is higher than in three of the states, Tennessee being the only one of the four in which the death rate among the colored is higher than in Porto Rico, 296.9 as compared with 283, in 1923-24. (See Chart VI.)

If we compare the death rates from tuberculosis (all forms) for the urban and rural populations of Porto Rico, with the rates for the United States Registration area, the rate for Porto Rico is seen to be higher in both instances, but the contrast is greater in the case of the urban population where the rate is five times that for the United States Registration area, the figures for 1924 being 91.2 and 456.6. The rural rates were 87.8 for the United States and 132.2 for Porto Rico.

As pointed out above, the tuberculosis death rate in Porto Rico is considerably higher among females than among males. (See Table 2.) The average annual rate, 1923-27, for men was 209.9, and for women, 256.2. (The numbers of males and females in the island's population are practically the same, the difference being around one per cent in favor of females. The average annual estimates for 1923-27 were 700,049 males and 708,500 females.) No study has been made of the reason for the higher tuberculosis mortality here in women but it may be suggested that the cause is to be found in the economic situation plus the burden of child bearing. There is frequently noted among the poor the tendency for the wife to give the working husband or son the larger share of the family's scanty food supply, that the income may be assured, while the island's very high birth rate shows the extra burden placed on the weaker sex.

CHART VI

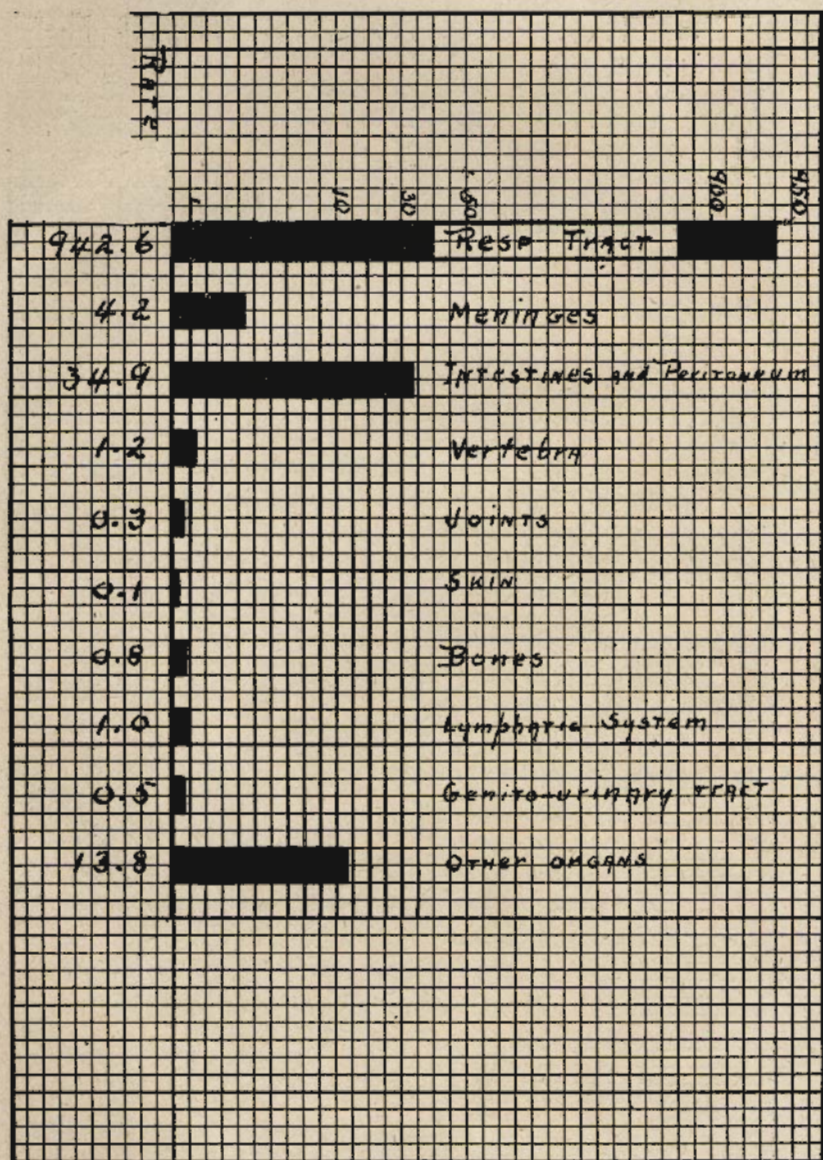
Mortality From Tuberculosis 1923 and 1924



RATE = No. of deaths from tuberculosis per 100,000 of population.

CHART VII

Mortality From Each Form of Tuberculosis in Porto Rico 1923-27



Note: The "rate" used in this chart signifies the number of deaths of each form of tuberculosis per 1000 deaths of the disease.

In regard to the type of tuberculosis seen in Porto Rico, we find, as was to have been expected, that the pulmonary form, chiefly the familiar chronic type, has an easy first place, with tuberculosis of the peritoneum and intestines a poor second. (See Chart VII.) The significance of this fact is discussed in the second paper of this series by Dr. Alice Burke, who reports findings in 142 autopsies done here in the past two years.

SUMMARY

The figures presented reveal the fact that tuberculosis in Porto Rico is a public health problem of shocking magnitude, the mortality from the disease being higher here than in any country of the civilized world for which accurate figures are available. The rate for the Island is approximately three times that of New York where the disease is treated as a very serious public-health problem. Furthermore, the statistics for the four-year period, 1923-27, indicate that conditions are growing worse rather than better. It is possible, however, that the recent recorded increase in tuberculosis deaths may be due in large part to better diagnosis and more careful reporting. But there is little comfort in this interpretation, for even if it is assumed that the rate is stationary, we must recognize the fact that the incidence is alarmingly high.

The problem concerns the cities primarily, the rate for the urban population being three and a half times as high as for the rural, though the contrast may not be actually as great as the figures indicate, on account of the less accurate death reports from the rural districts. The fact that *the rate for the towns of Porto Rico is practically five times that of New York City*, is a fair index of the gravity of the situation.