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## THE TREND OF RURAL AND URBAN TUBERCULOSIS MORTALITY

*A Summary of a Recent Study made by the  
Research Division of the Milbank Memorial Fund*




THE fact that Cattaraugus County has maintained a tuberculosis death rate for four successive years below any annual rate previously recorded in its history has served to add to the increasing interest in rural health problems, particularly tuberculosis prevention. More specifically, it invites more intensive scrutiny of the course of mortality from this disease in rural areas. What has been the trend of the tuberculosis death rate in country districts during the last thirty years? What outlook for the immediate future is afforded by records of the past decade and by our knowledge of probable changes in rural conditions? How does the course of the rural tuberculosis rate compare with that of the urban rate in


the light of the fact that the campaign against the disease in rural areas has not been carried on with the same degree of organization and thoroughness as in many cities?

These are but a few of the important questions open to inquiry. Dr. Allen K. Krause, in a recent editorial in the *American Review of Tuberculosis*, voiced the keen interest in the subject in the following words:

“If, under present conditions of environment and organized propaganda, the trend of tuberculosis is away from our cities and toward our rural sections, it is of enormous importance to discover the fact; as well as whether the country districts of agricultural states and sections are going the same way as those of highly developed industry. Accurate information on these points should give us more exact testimony of the influence of social hygiene than we have ever had heretofore, and will make clearer the directions of future effort. If rural tuberculosis is really holding its own, or increasing, while that in the cities is retreating, the fact is *prima facie* evidence that the far-flung organizations of the cities are working to effect while rural *laissez faire* is paying the penalty



WHAT effect correction of the death rates from tuberculosis for residence of the decedent had upon the trend of mortality from this disease as indicated by the crude rates reported from certain rural and urban communities in New York State, is discussed in the leading article of this issue of the *Quarterly Bulletin*. This summarizes a study made by the Research Division of the Fund, which will appear later in *The American Review of Tuberculosis*. On page 12 is presented the current mortality rates from tuberculosis in Cattaraugus County.



of its inaction.”

Unfortunately we cannot use the officially recorded death rates from tuberculosis for rural and urban areas because

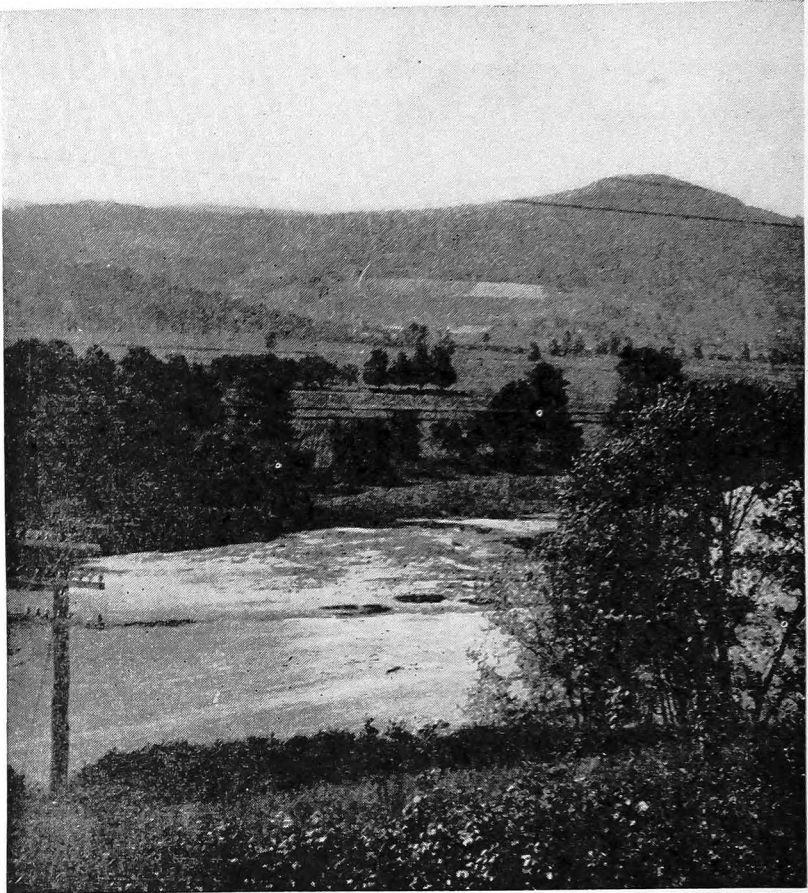
OLEAN, in Cattaraugus County, has been the scene of one of the most severe epidemics of typhoid fever experienced in recent years in any community of comparable size in the United States. Beginning on page 13, is an article on the epidemic. (The appropriation by the Cattaraugus County Board of Supervisors of \$66,000 to continue the program of the County Health Department in 1929, and the appointment of Dr. Edward T. Devine to succeed Dr. Bristol as executive officer of the Bellevue-Yorkville Health Demonstration, are announced in later pages.

they do not tell the story in a manner suited to our purpose. The chief trouble arises from the procedure of tabulating deaths according to *place of death* instead of according to *place of residence of the decedent*.

In the case of tuberculosis deaths this procedure results in peculiarly inaccurate statistics for the particular reason that many tuberculous persons die away from their homes in sanatoria and other institutions or

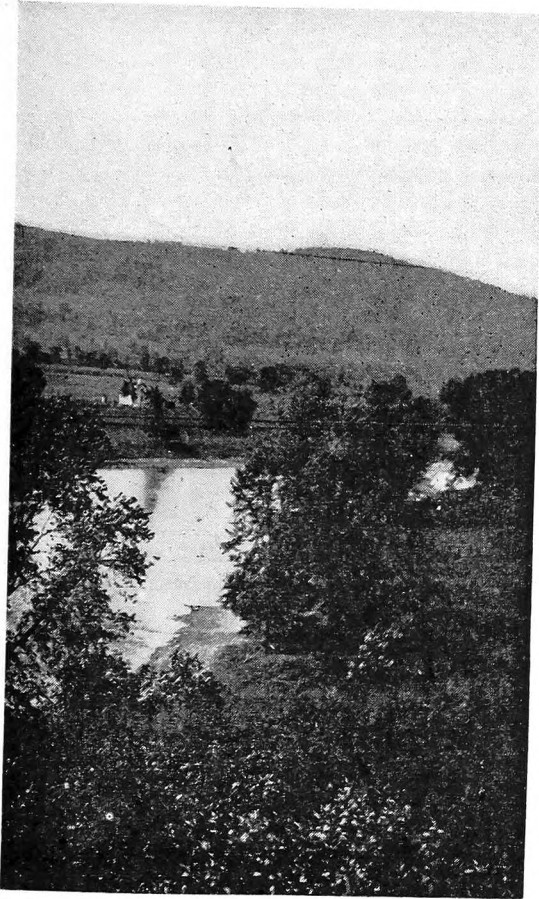
in places where the environment is thought to be more favorable for their recovery. Thus, the death rate for a rural area may appear to be higher than it actually is because many city people affected with tuberculosis in an advanced stage come to the country and die there, especially if the particular rural area contains a tuberculosis sanatorium. Conversely, the reported urban rate is too low. Obviously it is necessary to correct our statistics for residence of decedents before we can ascertain the trend of tuberculosis death rate either in urban or in rural populations and before we can compare the urban and rural statistics.

Recently two attempts have been made to find out what



the tuberculosis death rate actually is for urban and rural populations in New York. Dr. J. V. DePorte, director of the bureau of vital statistics of the New York State Department of Health, reallocated according to residence all of the deaths from the disease occurring in 1926\* and found that the rural rate was 59.4 per 100,000 population instead of 87.5, and that the urban rate (exclusive of New York City) was 83.2 instead of 70.4. The rate for New York City when corrected was 102.5 instead of 92.9. Miss Jessamine Whitney, statistician of the National Tuberculosis Association, partially

\*DePorte, J. V., Recorded and Resident Death Rates from Tuberculosis in New York State in 1926. *American Review of Tuberculosis*, June, 1928, xvii, 634-662.



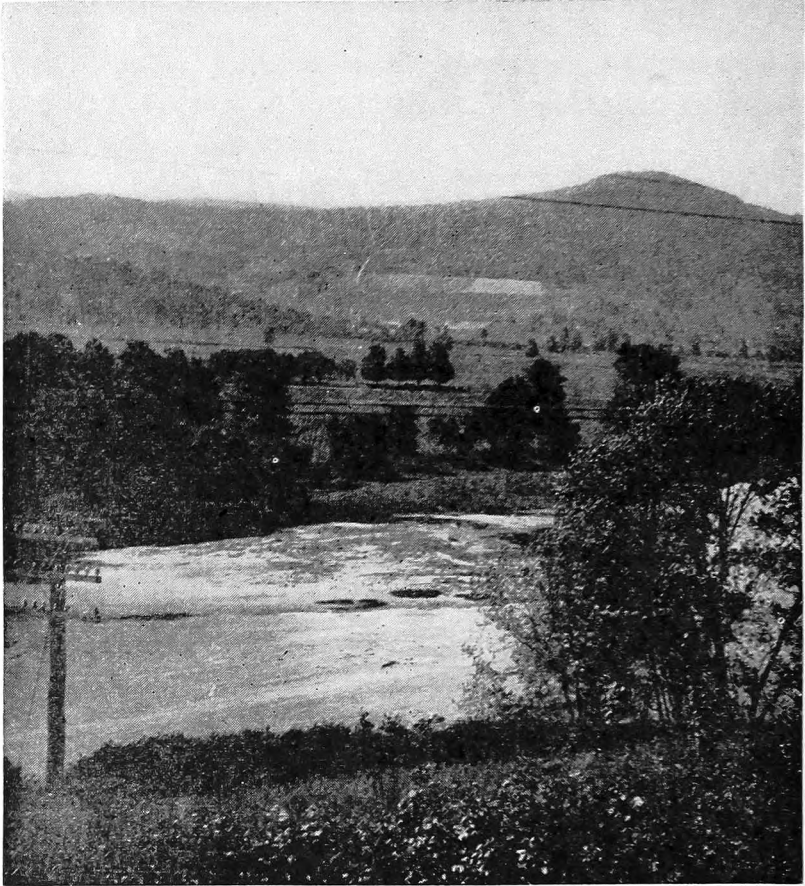
corrected the rates for rural areas in New York State for the years 1917-1924\* and found that they were considerably lower than the officially recorded rates. Clearly the correction for residence is an extremely important matter.

The correction of the rates for a period long enough to compare the urban and rural trends would be an extremely laborious undertaking even if the data were easily accessible. But, with

these two studies as a starting point, probably a fair approximation of the real trend of rural tuberculosis mortality can be arrived at by a somewhat different and less arduous method. This method is to select an area in New York State which has been and is essentially rural and whose recorded tuberculosis mortality would not be affected seriously by conditions that result in the inaccuracies already referred to, and to consider its tuberculosis death rate as representative of the rural population.

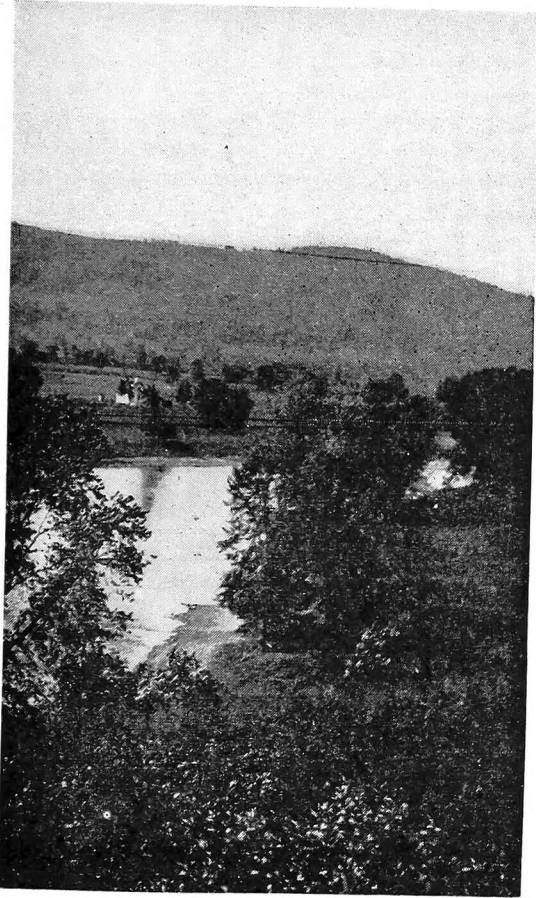
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selection of the area to be used. In making this selection we eliminated those whose recorded rates for 1926 differed considerably from Dr. DePorte's corrected rates as well as those which contained cities having a population as large as 50,000, and state institutions or large private sanatoria, and which did not have county sanatoria. Applying the limitations dictated by these considerations, we had left twelve counties as follows: Chautauqua, Chenango, Columbia, Delaware, Fulton, Herkimer, Jefferson, Montgomery, Ontario, Otsego, Steuben and Tompkins. The resident rate in 1926 for each of these counties differed less than 15 per 100,000 from the recorded rate and for six of these counties the difference was less than 5 per 100,000. The total population of these counties estimated as of 1926 was 742,177 and the tuberculosis death rate as recorded was 63.7 for 1926 compared with 61.6 for the total rural population of New York State (i. e., exclusive of cities having 10,000 or more population) as computed from Dr. DePorte's figures. Thus, the recorded rate for the rural section represented by the twelve counties was only 2.1 per 100,000 above the resident tuberculosis rate for all the rural part of New York State as defined above. It seemed to us, in view of the other considerations set forth, that we had selected a fairly representative section of New York State which has been and is essentially rural and is not affected to a great extent by the factors which result in gross discrepancies between recorded and resident rates. Using this territory in this manner, the deaths from tuberculosis as published by the Federal Bureau of the Census beginning with 1900 through 1915, and by the New York State Department of Health from 1916 on, were compiled and annual rates were computed.

Now if the twelve counties selected can be assumed to have been and to be a fairly representative rural section, the



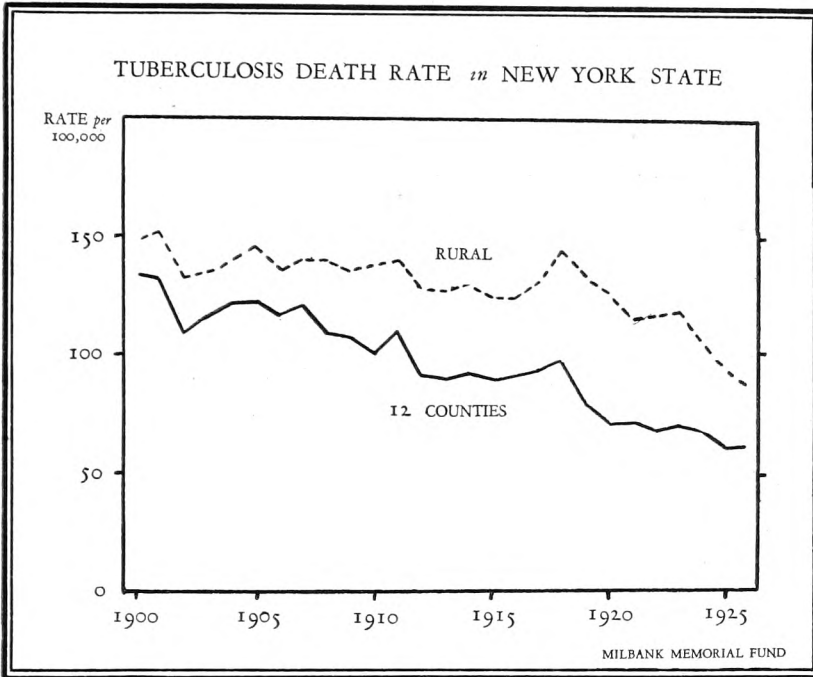


Fig. 1. Annual death rates per 100,000 population from tuberculosis (all forms) as recorded in 1900-1926 for the rural part of New York State (including towns and cities with populations of less than 10,000) compared with those for the entire population of twelve counties selected as typically rural and as not affected by gross discrepancies between recorded and resident rates.

trend of its tuberculosis death rate since 1900 is an interesting epidemiological fact. As shown graphically in Fig. 1, it was lower than the recorded rate for all of rural New York in every one of the twenty-seven years. Up to 1908 correction for non-resident deaths apparently would have had little effect upon the rate; in subsequent years, however, the difference between the two rates increased, at least until 1924. Thus it appears that the downward trend of the tuberculosis death rate in a representative rural section has been greater and more consistent during the twenty-seven year period than the officially recorded death rate for rural New York indicates.

of numbers of deaths; since these deaths represent the net extent to which the urban rate should be corrected for residence, they are added to the deaths recorded as occurring in urban localities. The urban rates as thus corrected of necessity include New York City and exclude cities of less than 10,000 persons. The reader is referred for details to the more extended report on this study which will appear later, but it may be stated that these estimated urban rates as corrected, follow closely the trend of the rate for the ten cities from 1914 to 1927 although on a somewhat higher level because they include New York City, and check with Dr. DePorte's 1926 findings within 5 per cent. It is believed that they are reasonably close approximations to the urban rates if corrected.

We are now in a position to compare the picture afforded by the *recorded* urban and rural tuberculosis death rates with that afforded by the probably more accurate rates we have arrived at. Such a comparison is afforded in Figs. 2 and 3.

Considering the more correct picture shown in Fig. 3, it is indicated by all of the available data that throughout the period 1900-1926 the urban tuberculosis death rate was higher than the rural.

Finally, the trends of urban and rural rates may be compared. Since it appears that the urban rate was twice the rural rate from 1900 to 1916, and only about 50 per cent higher than the rural rate in 1921-1926, it is clear that the urban rate has been falling faster than the rural in recent years. A comparison of the trends will be more easily seen if the annual death rates are plotted on a logarithmic ordinate scale and one graph is superimposed upon the other, as in Fig. 4. The *rate of change* in the trends is thus made comparable. Two indications yielded by this comparison are of major interest. One is that the trend of both rural and urban tuberculosis death rates from 1900 to about 1916 was essen-

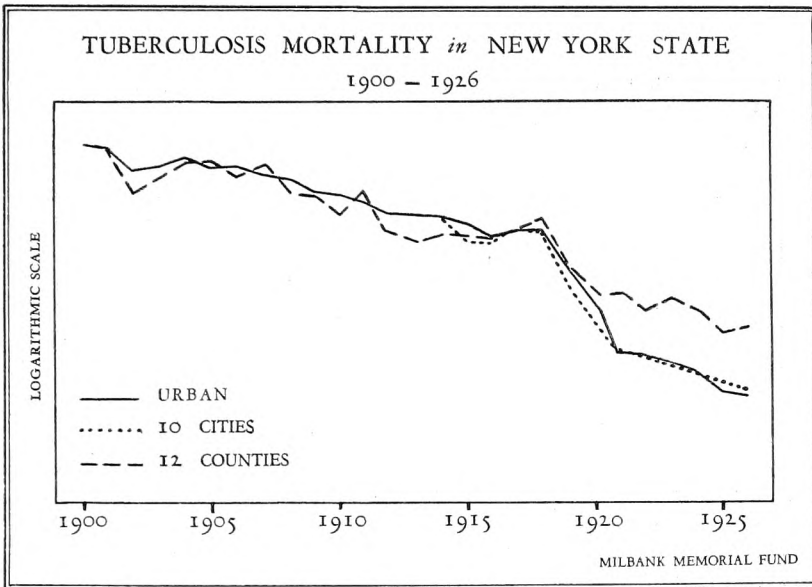
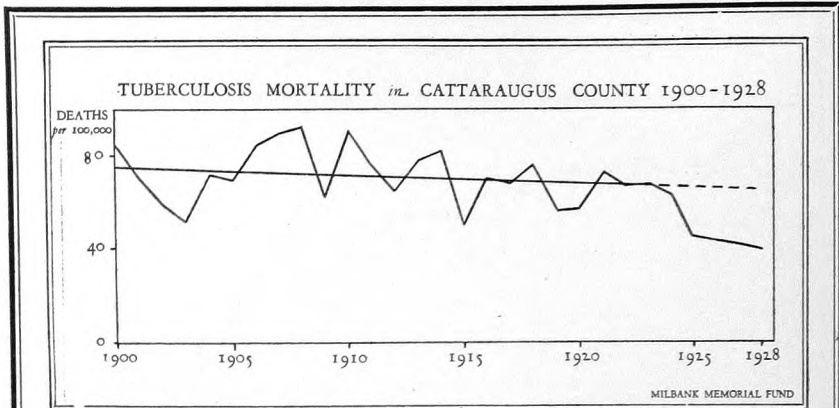


Fig. 4. Same as Fig. 3, but plotted on a logarithmic ordinate scale with contrasted rates for the twelve counties and urban New York State superimposed for 1900 and the rates for urban New York State and the ten cities superimposed for 1914, in order to compare the *slope* of the graphs.

tially the same. Although the urban rate maintained itself at a ratio to the rural rate of about two to one, the proportionate decline was approximately the same in both populations. This may be interpreted broadly by saying that the *net* change in the course of the tuberculosis death rate in both urban and rural populations resulting from the interplay of various and probably differing factors in two unlike situations was very similar during this period. The other indication is that the forces favoring a decline in the tuberculosis death rate have been more powerful in cities than in country districts since the World War.

What these forces were and how they were interrelated is a subject upon which it is hoped the experience of Cattaraugus County and of other rural and urban areas will throw some light.



THE deaths from tuberculosis recorded in Cattaraugus County for the first eleven months of 1928 indicate that the mortality rate in 1928 will continue on the low level maintained since 1924.

The significance of four consecutive annual rates as low as those for 1925-1928 cannot be judged yet except in the light of the previous experience of Cattaraugus County alone. To compare this reduction with the decline or absence of decline in the tuberculosis deaths in any other area and to try to draw any conclusions as to the possible factors involved would be grossly unwarranted unless the effects of these factors upon the death rate from the disease in all of the areas compared were known with reasonable accuracy.

This has not yet been determined for any other area. For Cattaraugus County, however, careful inquiries, statistical and otherwise, have so far failed to indicate any marked change in the conditions possibly involved during the past decade or more except the development of anti-tuberculosis activities that are considered to be efficient by competent judges.

Deaths from tuberculosis (all forms) per 100,000 population in Cattaraugus County, 1900-1928\*

Year	Death Rate per 100,000	Year	Death Rate per 100,000
1900	83.5	1915	50.1
1901	71.1	1916	70.2
1902	58.7	1917	68.2
1903	52.5	1918	76.3
1904	72.6	1919	57.1
1905	69.5	1920	58.1
1906	83.9	1921	73.2
1907	89.4	1922	67.2
1908	92.5	1923	68.1
1909	61.6	1924	63.6
1910	89.2	1925	45.3
1911	76.2	1926	43.7
1912	65.0	1927	42.1
1913	77.9	1928	39.8†
1914	81.8		

\*Indian deaths and deaths of non-residents in the J. N. Adam Memorial Hospital have been excluded.

†Provisional annual rate based on eleven months.