

found simple, rapid, and accurate, and was advised as a routine method of typing.

In 1934 it was obvious that by the end of the study in 1935, if the State took over the production and distribution of serum, it would have to be equally available to all physicians . . . and that . . . the distribution of the serum dispensed should be restricted for use only in early Type I and Type II cases. By the end of 1935 serum was equally available to all physicians in the State through the State Bacteriologic Laboratory and eight hospitals in Boston, as well as from fifty-seven hospitals outside Boston, making a total of sixty-six depots in all.

Records of 956 cases of lobar pneumonia treated with Type I and Type II anti-serum were analyzed and the results showed conclusively that serum can be used successfully by physicians in general practice. A comparison of the fatality rate of the treated cases with the expected fatality rate of cases of the same type not receiving serum indicated a saving of the lives of eighty-nine patients.

Undoubtedly this experiment in pneumonia control in Massachusetts is of great interest to other communities.

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## COMPARATIVE MORTALITY OF PATIENTS DISCHARGED FROM TUBERCULOSIS SANATORIA

THE importance of more adequate rehabilitation including continued medical supervision for the tuberculous patient after a period of sanatorium care is strikingly indicated by the rate of survival of such patients for the immediate years after discharge. Dr. H. E. Hilleboe has rendered a service to those interested in tuberculosis control in assembling the post-sanatorium mortality experience of various classes of cases from studies using suitable control populations for comparison.<sup>1</sup> The studies which he discusses particularly are drawn from the Midhurst Sanatorium and the Brompton Sanatorium in England, the Adirondack Cottage Sanitarium (later Trudeau Sanatorium), and the Metropolitan Life Insurance Company's Sanatorium, both in New York State.

<sup>1</sup> Hilleboe, H. E.: The Comparative Mortality of Patients Discharged from Tuberculosis Sanatoria. *The American Review of Tuberculosis*, December, 1936, xxxiv, No. 6.

Life table methods of analysis were employed in all of these studies and the ratio of actual to expected deaths was used to measure the force of mortality. The various studies showed remarkable agreement and the conclusions which were drawn from the studies are as follows:

1. A person with minimal tuberculosis has his risk of dying increased approximately four times; moderately advanced, sixteen times; and far advanced, forty times over that of persons in the general population from which the patients were drawn.
2. Females with minimal disease did not experience as high a mortality rate as males of the same class (except in the Metropolitan study); however, the females with far-advanced disease were more severely affected.
3. The age, classification of disease on admission, and condition on discharge were important variables to be considered in aftermortality.
4. The length of residence was an important factor, particularly in the minimal and moderately advanced cases.
5. The presence or absence of tubercle bacilli in the sputum on admission and discharge had a markedly noticeable effect on the aftermortality.
6. The stage of the disease on admission of the patient was a more potent factor in the future survivorship than the fact that his antecedents were tuberculous.
7. The excess mortality was highest during the first two years after discharge, and increased in amount with the severity of the disease.

Dr. Hilleboe rightly feels that "this mortality experience of discharged patients is of practical importance to physicians, administrators, employers, insurance companies, and social service workers who assume the responsibility of rehabilitation." Certainly the problem of tuberculosis control is not entirely solved by securing sanatorium care for the tuberculous; for, as the author points out, the urgent need for universal provision of adequate medical supervision of discharged tuberculous patients is only too obvious in view of the excessive high mortality experiences.

Perhaps of more importance even than the assembling of the mortality experience of post-sanatorium patients is the fact that Hilleboe indicates the need for better and more practical use of data on tuberculosis cases; data which are easily available in the sanatoria throughout the country

and which can be used for the study of fundamental questions concerning tuberculosis which remain largely unanswered. Furthermore, he draws attention to the relatively simple method of statistical analysis, that of converting observations on patients to terms of life experience, which can be used with great flexibility in comparative studies of the problems associated with tuberculosis mortality. His clear and comprehensive discussion of the factors or variables which must be carefully considered in evaluating mortality among tuberculous patients is important and should be most helpful to those interested in the study of tuberculosis.

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