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## EDITORIAL <sup>1</sup>

### TEAMWORK IN TUBERCULOSIS CONTROL

Wartime scientific accomplishments have clearly revealed the value of planned, coordinated research in arriving speedily at the solution of definite problems. Not the least repercussion of atomic fission is the stimulus it gives to group activity in research. The atomic bomb destroyed all things; yet it had positive virtue in that it delivered man's mind from old modes of thought and action, and brought to the imagination of all creative thinkers a vision of the future in which no man can go alone.

The achievement of atomic fission is not the consequence of the work of a single man. The story of the community of effort that led to this discovery is widely known. Such organization of time, brains, energy, and money, applied now to current medical problems, could bring, in a future not far away, cures for tuberculosis, heart disease, or cancer. Even though the complexities of the age constantly emphasize the need for teamwork, there will be scientists who will remain intellectually aloof in their ivory towers. Such men have contributed importantly to the progress of science. Nevertheless, experience shows that advancement must largely rely on the efforts of a variety of scientists, whose efforts are cooperatively directed toward the realization of definite goals. The potentialities of planning and teamwork in the field of disease control have not yet been fully realized. Group work here, as elsewhere, can realize results heretofore delayed by inadequate organization and random inquiries.

The Tuberculosis Control Division is one of many groups that profited by the wartime example of the National Research Council in

\*This is the second of a series of special issues of PUBLIC HEALTH REPORTS containing articles devoted exclusively to tuberculosis control, which will appear the first week of each month. The series began with the Mar. 1, 1946, issue.

<sup>1</sup> From the Office of the Chief, Tuberculosis Control Division.

the United States and the Medical Research Council of Great Britain. Immediately after its organization the Division instituted as speedily as possible a number of cooperative research projects, which are producing valuable results. The more important of these undertakings have included studies in minimal lesions and pulmonary fungus infections in cooperation with the Medical Research Committee of the National Tuberculosis Association, the University of Kansas, the Kansas City, Mo., and Kansas State health departments; mortality studies in cooperation with the Bureau of the Census; studies in cooperation with the University of Michigan on methods of reproducing X-ray films, investigations into the use of mass radiography in general hospitals, and researches in experimental radiology. Follow-up studies with Temple University of patients discovered to have minimal tuberculosis in industrial surveys are now under way; and studies are being developed at the University of Chicago of the electronic amplification of the fluorescent image and its use in photofluorography. The Electronics Laboratory of the Division in Rockville, Md., cooperates with the National Electrical Manufacturers' Association in studies of methods of standardization of photofluorographic equipment. In addition, the Division materially encourages fundamental research in the unrelenting effort to discover a drug or biologic that will be effective against the tubercle bacillus.

The article in this issue, "Geographic Difference in Sensitivity to Histoplasmin among Student Nurses," is the second in a series on researches carried on by the personnel of the Division. The first article of the series,<sup>2</sup> published May 11, 1945, was recognized as a significant contribution to the epidemiology of tuberculosis.

Many grave problems confront us in the fight against tuberculosis. We must know more about the mode of spread of this insidious disease. We must know why it selects certain age groups and races. And certainly we must learn the secret of its completely successful defense against every drug and biologic now known.

The recent brilliant success of molds and other micro-organisms against venereal disease and other intractable infections has stimulated the search for some chemotherapeutic agent that will prevent entrance of tubercle bacilli into the body, or kill them after they have become secure, or arrest the progress of their destruction.

There have been within the last few years some promising applications of drugs to tuberculous laboratory animals; but at the moment no satisfactory results have been realized from limited experiments on human beings. Even the newest drug, streptomycin, has not proved its efficacy.

Extensive collaborative research, firmly directed, adequately

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<sup>2</sup> Palmer, Carroll E.: Nontuberculous pulmonary calcification and sensitivity to histoplasmin. *Pub. Health Rep.*, 60: 513-520.

financed, and carried forward by the teamwork of many men, must be initiated in even larger measure than before, if tuberculosis is to be eradicated.

## GEOGRAPHIC DIFFERENCES IN SENSITIVITY TO HISTOPLASMIN AMONG STUDENT NURSES<sup>1</sup>

By CARROLL E. PALMER, *Senior Surgeon, United States Public Health Service*

Several recent papers point to the fact that skin sensitivity to histoplasmin, determined by intradermal testing with the filtrate of a culture of *Histoplasma capsulatum*, is relatively common in certain parts of the United States. Some of this work indicates, also, that there is a close relationship between histoplasmin sensitivity and pulmonary calcification in tuberculin negative reactors. After carefully reviewing the pertinent data of earlier reports, Christie and Peterson (1) have presented the results of a study of tuberculin and histoplasmin tests and chest X-ray films of 181 children from middle Tennessee. They find that over 70 percent of the children reacted positively to histoplasmin and suggest that there exists "an immunological relationship between histoplasmin sensitivity and the problem of pulmonary calcification." Similar results relative to the relationship between histoplasmin sensitivity and pulmonary calcification have been reported by Palmer (2), from studies on student nurses. Emmons et al. (3) find that 40 percent of 136 patients at St. Elizabeths Hospital react to histoplasmin, but on the basis of animal experiments, as well as of human testing, question the specificity of the histoplasmin test, since they were able to show that there are cross reactions between histoplasmin, blastomycin, haplosporangin, and coccidioidin.

Undoubtedly, further study is required to determine whether the reactions to histoplasmin in humans are an indication of infection with *H. capsulatum* or with another organism. It is quite clear, however, that histoplasmin reaction is a specific indication of some previous experience, presumably infectious. The experimental work on fungus infection reported by Emmons et al. supports this interpretation. The high correlation of the histoplasmin reaction with pulmonary calcification is additional strong evidence of the medical significance of the reactions.

In the earlier report of studies on student nurses Palmer has given some indication that there are wide geographic differences in sensitivity to histoplasmin. The present paper, an extension of the work on student nurses, represents an attempt to describe in greater detail

<sup>1</sup> From the Field Studies Section, Tuberculosis Control Division.

the geographic distribution of histoplasmin sensitivity in the United States.

Basic data for the study are derived from the investigation on early tuberculosis being conducted cooperatively by the National Tuberculosis Association and the United States Public Health Service. Over 10,000 student nurses in the participating nursing schools in 11 cities have been given histoplasmin tests. The test consisted of the intradermal injection of 0.1 cc. of a 1/1,000 dilution of a filtrate of broth culture of *H. capsulatum* furnished by Dr. C. W. Emmons, of the National Institute of Health.<sup>2</sup> Measurements of both erythema and induration were recorded at 48 hours, and reactions of 5 or more millimeters of induration were classified as positive. Reactions of less than 5 mm. of induration and those showing only erythema were classified as doubtful. A considerable degree of uniformity of results was assured because essentially all of the tests were given and interpreted by two persons who worked together on the program. About 7,000 tests were made during the spring of 1945, the remainder during the fall of 1945.

The study, therefore, is based on a specific segment of the population, young women mostly between the ages of 18 and 21 years. The fact that approximately 40 percent of the student nurses had been in training less than 12 months at the time of the tests tends to minimize any occupational factor associated with nursing. Nurses present the advantage of control of such variables as age and sex between testing areas throughout the country. Since the proportion of positive reactors undoubtedly would be different among groups of other age and sex, the primary point which this paper seeks to establish is not the actual level of sensitivity to histoplasmin in different areas of the United States, but rather the relative levels of sensitivity in different localities. The actual level of sensitivity to histoplasmin in different areas of the United States is not the primary point which this paper seeks to establish, but rather the relative levels of sensitivity in different localities.

Table 1 gives the percentages of positive and doubtful reactors among 10,580 student nurses tested in 11 cities. For the total groups, 20.1 percent were positive, while 3.2 percent were doubtful reactors. It is clear from the material in table 1 that the percentages of histoplasmin reactors vary greatly in the different cities where the nurses were tested. Among the students tested in the Minneapolis schools, less than 5 percent show a positive reaction, while in the Kansas City, Mo., schools nearly 60 percent were sensitive.

True geographic differences, insofar as specified cities are concerned, are obscured by the fact that the data are based on testing areas rather than on residence. Student nurses from areas where the prevalence

<sup>2</sup> This is the antigen designated as H3 in the paper by Emmons et al. (3).

of histoplasmin reactivity is low often go to nursing schools in regions of high prevalence; and many from the latter regions attend nursing schools where the prevalence is low.

TABLE 1.—Percentage of histoplasmin reactors among student nurses in specified cities

Cities	Number of persons tested	Percentage of histoplasmin reactors	
		Positive	Doubtful
Kansas City, Mo. ....	826	58.1	7.1
Columbus, Ohio.....	829	57.8	4.0
Kansas City, Kans.....	357	45.4	5.3
Baltimore, Md.....	1,356	23.6	2.9
New Orleans, La.....	693	18.5	6.8
Detroit, Mich.....	772	13.2	1.7
Philadelphia, Pa.....	884	12.7	2.4
Los Angeles, Calif.....	1,403	10.6	3.4
San Francisco, Calif.....	824	6.8	1.7
Denver, Colo.....	1,147	5.8	1.6
Minneapolis, Minn.....	1,489	4.8	1.9
Total.....	10,580	20.1	3.2

To obtain material for a more precise study of geographic variation, each student nurse was assigned to the State in which she had spent the major part of her life. For the purposes of this paper, nurses who had spent five-sixths or more of their total lifetime in one State are designated as "life-time residents." Of the 10,580 student nurses receiving histoplasmin tests, 8,141, or 77 percent, could be so classified. The definition of what constitutes lifetime residence is obviously somewhat arbitrary. It would, of course, have been more desirable to base the study on nurses who had spent all their lives in one locality. However, it is the rare exception to find persons in the United States who have never left their place of birth, even for a short period. It is realized that occasionally a nurse who may have spent five-sixths of her life in a low prevalence area may have acquired sensitivity during residence in an area of high prevalence. However, the increased reliability of the rates of reactors when more cases are included was considered sufficient to offset the disadvantages of using less rigorous criteria of residency. The definition used would appear to be a reasonable compromise. The analysis given in this paper is based, therefore, on this group of 8,141 so-called lifetime resident nurses. Further, the analysis is limited to rates for positive reactors, doubtful reactors being included in the negative group.

Table 2 shows the distribution of the 8,141 students according to State of lifetime residence. For some States, the number of cases is small and the percentage of positive reactors is calculated and shown only for those for which 50 or more nurses were tested. State boundaries are arbitrary political dividing lines with little significance in a geographic distribution of sensitivity to histoplasmin. Therefore, in order to obtain more meaningful boundaries with respect to

reactions, each State was subdivided into nine sections on the basis of the United States postal sections which are also arbitrary geographical subdivisions, but smaller and less likely to obscure differences. Nurses were classified according to residence within a specific section of a State. In addition, nurses who failed to meet the requirements

TABLE 2.—Nurses receiving histoplasmin classified by reaction and by lifetime residence <sup>1</sup>

State of lifetime residence	Nurses receiving histoplasmin		
	Number tested	Number positive	Percent positive
United States.....	8, 141	1, 699	20. 9
Alabama.....	26	6	(?)
Arizona.....	20	1	(?)
Arkansas.....	34	18	(?)
California.....	1, 195	67	5. 6
Colorado.....	460	4	0. 9
Connecticut.....	8	0	(?)
Delaware.....	6	0	(?)
District of Columbia.....	31	14	(?)
Florida.....	70	3	4. 3
Georgia.....	23	0	(?)
Idaho.....	12	0	(?)
Illinois.....	67	24	35. 8
Indiana.....	38	25	(?)
Iowa.....	132	29	22. 0
Kansas.....	408	159	39. 0
Kentucky.....	22	17	(?)
Louisiana.....	326	70	21. 5
Maine.....	4	0	(?)
Maryland.....	502	154	30. 7
Massachusetts.....	17	3	(?)
Michigan.....	598	49	8. 2
Minnesota.....	937	38	4. 1
Mississippi.....	71	20	28. 2
Missouri.....	389	310	79. 7
Montana.....	23	0	(?)
Nebraska.....	159	12	7. 5
Nevada.....	16	3	(?)
New Hampshire.....	4	2	(?)
New Jersey.....	42	1	(?)
New Mexico.....	50	5	10. 0
New York.....	88	8	9. 1
North Carolina.....	37	1	(?)
North Dakota.....	88	1	1. 1
Ohio.....	762	459	60. 2
Oklahoma.....	40	15	(?)
Oregon.....	7	0	(?)
Pennsylvania.....	883	121	13. 7
Rhode Island.....	1	0	(?)
South Carolina.....	11	0	(?)
South Dakota.....	96	1	1. 0
Tennessee.....	10	4	(?)
Texas.....	61	21	34. 4
Utah.....	15	1	(?)
Vermont.....	1	0	(?)
Virginia.....	48	7	(?)
Washington.....	16	0	(?)
West Virginia.....	86	23	26. 7
Wisconsin.....	122	2	1. 6
Wyoming.....	79	1	1. 3

<sup>1</sup> Includes only nurses who lived in one State at least five-sixths of a lifetime.

<sup>2</sup> Percentages not shown for States with less than 50 cases tested.

for lifetime residence within any one section of a State but who had lived at least five-sixths of their lives within the boundaries of the State were classified as "State-wide" residents and were added to the total of the nine sections to give the total of lifetime residents of the State in question.

Where contiguous postal sections were similar in prevalence of histoplasmin sensitivity or where the number of reactors was so small as to lack stability, combinations into larger areas were made. Thus, in some instances, the data from several States are combined into broader geographic areas; in other States, mainly in those containing the cities where testing was done, a sufficient number of cases were available to permit analysis on the basis of postal sections or combinations of postal sections. In several instances, several postal sections within a State were included within a contiguous area that had a similar prevalence of histoplasmin sensitivity. Nurses who had only State-wide residence, but could not be assigned to a particular section, were not included in any subdivision by area of prevalence within the State.

Table 3 and figure 1 show the results of assembling the available data to obtain a general view of the frequency of positive histoplasmin

TABLE 3.—*Number and percent of positive reactors among student nurses tested with histoplasmin in specified regions in the United States*<sup>1</sup>

Region	Percent positive	Number positive	Number tested
I.....	68.3	716	1,049
II.....	37.5	24	64
III.....	31.9	252	791
IV.....	23.1	124	537
V.....	17.6	16	91
VI.....	10.1	143	1,422
VII.....	6.8	42	616
VIII.....	5.0	43	855
IX.....	2.8	4	141
X.....	1.4	20	1,394

<sup>1</sup> Included only nurses who lived in one State at least five-sixths of lifetime. When a State is divided between two or more regions, nurses who lived in more than one section of the State are excluded from any region.

reactors in the country as a whole. The map, figure 1, shows the extremely wide range in frequency of reactors from 1.4 percent in the northwestern part of the country to nearly 70 percent in the eastern central part of the country.

Region I, an area of high prevalence, includes Tennessee, Kentucky, Arkansas, Missouri, Indiana, and parts of Ohio, Illinois, Kansas, and Louisiana, where 716, or 68.3 percent, of 1,049 lifetime residents reacted positively to histoplasmin. Just north of this area, in region II, the southeastern portion of Iowa and northern Illinois showed a

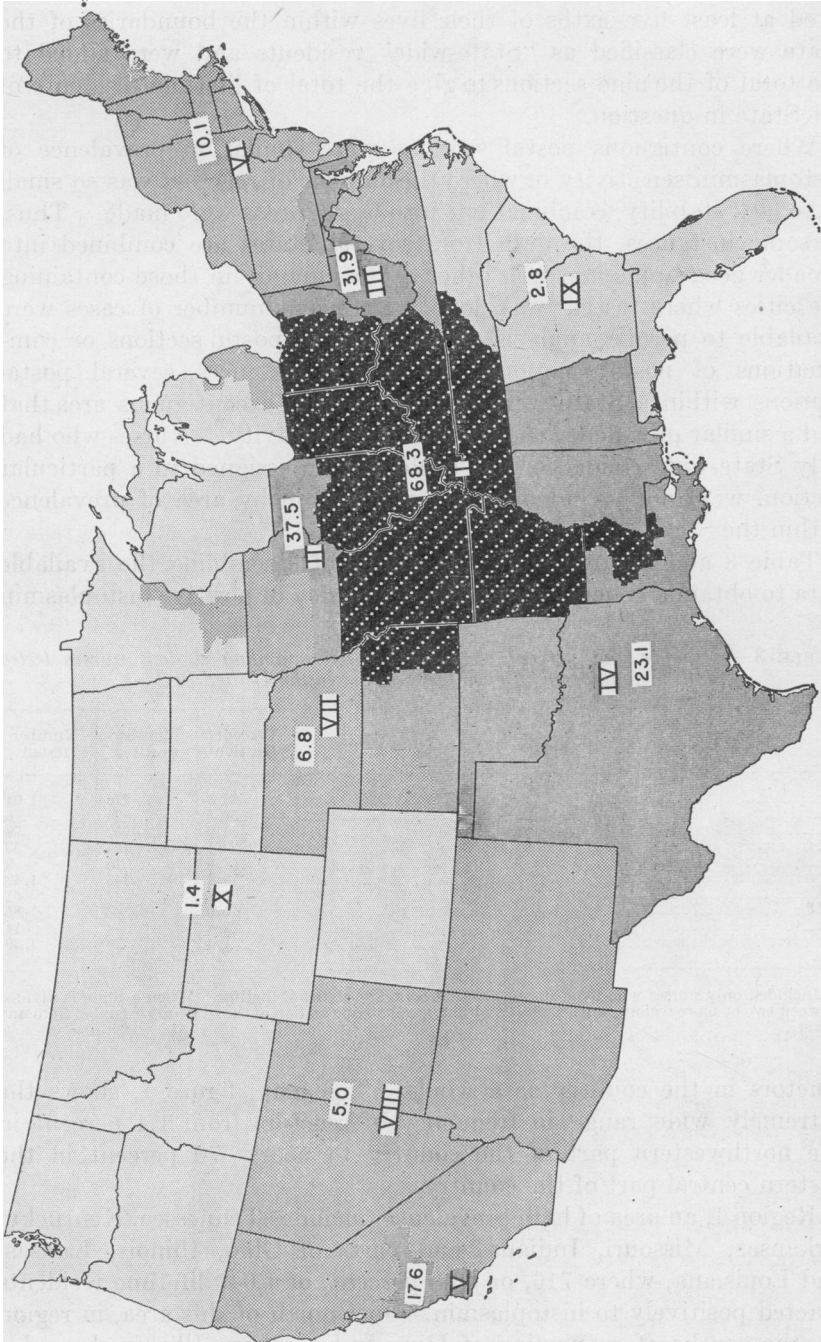


FIGURE 1.—Percentage of positive histoplasmin reactors among student nurses in specified regions of the United States, classified by State of lifetime residence.



rate of 37.5 percent positive reactors, or 24 of 64 lifetime residents. On the eastern border of the high prevalence area, region III, comprising eastern Ohio, south central Pennsylvania, West Virginia, the District of Columbia, and most of Maryland, with 31.9 percent positive, or 252 of 791 nurses, shows a lower rate, but one which is higher than the rest of the Atlantic seaboard. In a quarter-circle west and south of the area of highest prevalence, 124 positive reactors in region IV, central Kansas, Oklahoma, western and southern Louisiana, Mississippi, and Alabama, constitute 23.1 percent of a group of 537 nurses.

Still further away from the area of high prevalence, in the northeastern section of the United States, region VI, consisting of eastern Michigan, New York, the New England States, most of Pennsylvania, New Jersey, Delaware, southern Maryland, and Virginia, only 10.1 percent, or 143 of the 1,422 nurses reacted positively to histoplasmin. Another area of moderate prevalence of histoplasmin sensitivity, region VII, includes northwestern Kansas, Nebraska, northern Iowa, and a strip of southeastern Minnesota, where only 42, or 6.8 percent, from among 616 reacted positively. Region VIII in the southwest section of the United States, including most of California, Nevada, Utah, Arizona, and New Mexico, had only 43 positive reactors or 5.0 percent of 855 lifetime residents. A comparatively high area in central California, region V, showed 17.6 percent, or 16 positive reactors in the 91 lifetime residents.

Two areas of very low prevalence were found in the Northwest and the Southeast. In region IX, in the southern Atlantic States of North Carolina, South Carolina, Georgia, and Florida, only 4 positive reactors, or 2.8 percent, were found among 141 nurses. Similarly, region X, stretching across the northeast northwestern two-thirds of the country from Washington and Oregon to western Michigan, and from Colorado to the Canadian border, contained only 20 positive reactors, or 1.4 percent of the 1,394 residents.

The great importance of geography in any study of this problem is clearly demonstrated by the data presented in table 4 which show the results of the analysis of within-State variations. Maps for 9 States in which testing areas are located are shown in figures 2 and 3. Although Denver is a testing area, no map of Colorado is shown because only 4 positive reactors were observed among 458 lifetime residents.

The most striking geographic variation to be found in the material available for analysis occurs in 3 States, Missouri, Kansas, and Colorado. In northwestern Missouri and northeastern Kansas 78.8 percent of the lifetime residents reacted positively, while in the surrounding area on the east, south, and west, the prevalence dropped to 54.1 percent. Directly to the west, in central Kansas, 21.3 percent of the

nurses reacted positively, while in the northwestern corner of Kansas only 6.9 of the lifetime residents were reactors. Still farther west, in the whole State of Colorado, less than 1 percent reacted. From these data it would seem likely that from the eastern to the western border of Kansas there is change from approximately 80 percent to 1 percent in positive histoplasmin reactors.

TABLE 4.—Nurses receiving histoplasmin in certain States, classified by section of State of lifetime residence

Section of State	Nurses receiving histoplasmin		
	Number tested	Number positive	Percent positive
Minnesota:			
I.....	287	9	3.1
II.....	346	21	6.1
III.....	95	0	0.0
Michigan:			
I.....	99	2	2.0
II.....	374	29	7.8
California:			
I.....	297	9	3.0
II.....	91	16	17.6
III.....	456	24	5.3
Ohio:			
I.....	59	51	86.4
II.....	396	253	63.9
III.....	118	33	28.0
Louisiana:			
I.....	217	36	16.6
II.....	34	19	55.9
Kansas and Missouri:			
I.....	29	2	6.9
II.....	122	26	21.3
III.....	321	253	78.8
IV.....	122	66	54.1
Pennsylvania and Maryland:			
I.....	625	59	9.4
II.....	471	156	33.1
III.....	20	3	15.0

Ohio, where 60.2 percent of 762 nurses were reactors, showed considerable variation in different parts of the State, although this was not as great as in Kansas. Positive histoplasmin reactors were heavily concentrated in southwestern Ohio with 86.4 percent. The adjoining area on the north and east showed 63.9 percent and the prevalence continued to decrease in eastern Ohio where only 28.0 percent of the nurses were positive.

Louisiana divides into two distinct regions, the northwestern section with 55.9 percent positive, and the remainder of the State with only 16.6 percent positive.

Pennsylvania and Maryland may be considered together because of their geographic proximity. While nearly all of Pennsylvania showed a moderate rate of only 9.4 percent positive reactors, the south central area combines with the northern two-thirds of Maryland to form an area of fairly high prevalence, 33.1 percent. The concentration faded in southern Maryland where only 15 percent of the lifetime residents were positive.

California is a State of fairly marked contrasts in histoplasmin reactivity. In the northern half of the State, only 3.0 percent reacted positively, while the southern portion showed 5.3 percent. Stretching

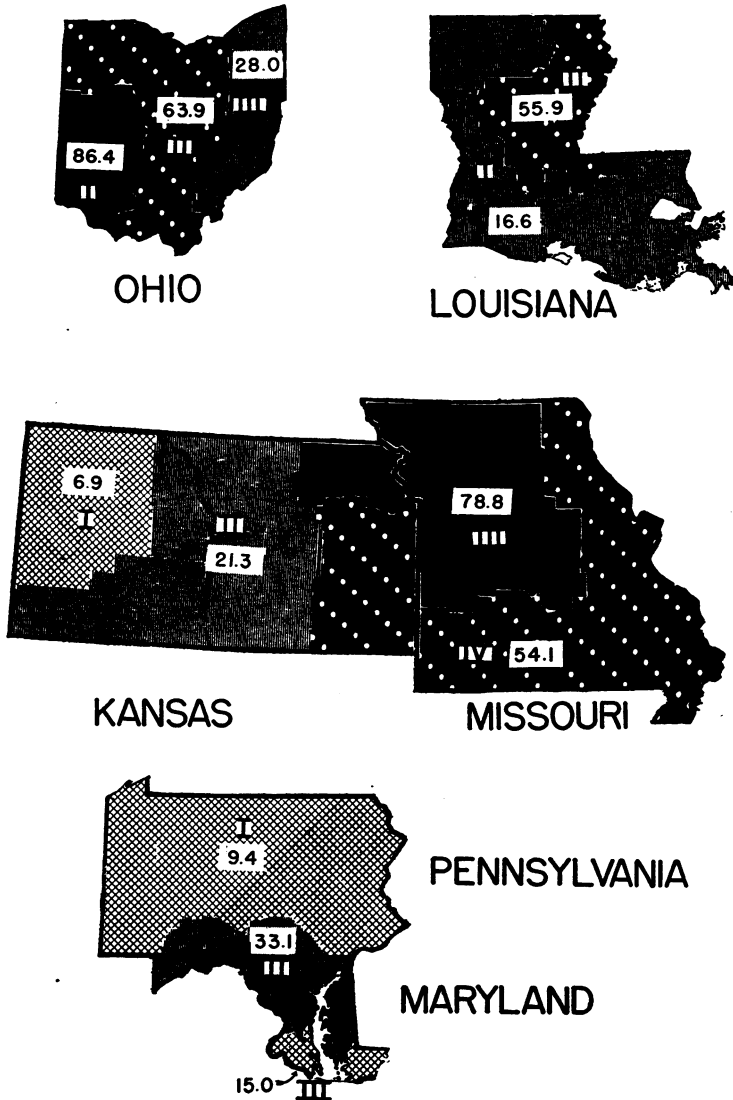


FIGURE 2.—Percentage of positive histoplasmin reactors among student nurses in certain States, classified by section of State of lifetime residence.

nearly across the State between the two areas lies a band of moderate prevalence, 17.6 percent.

Southeastern Michigan, with 7.8 percent, differs from the rest of the State, which contains only 2.0 percent positive reactors.

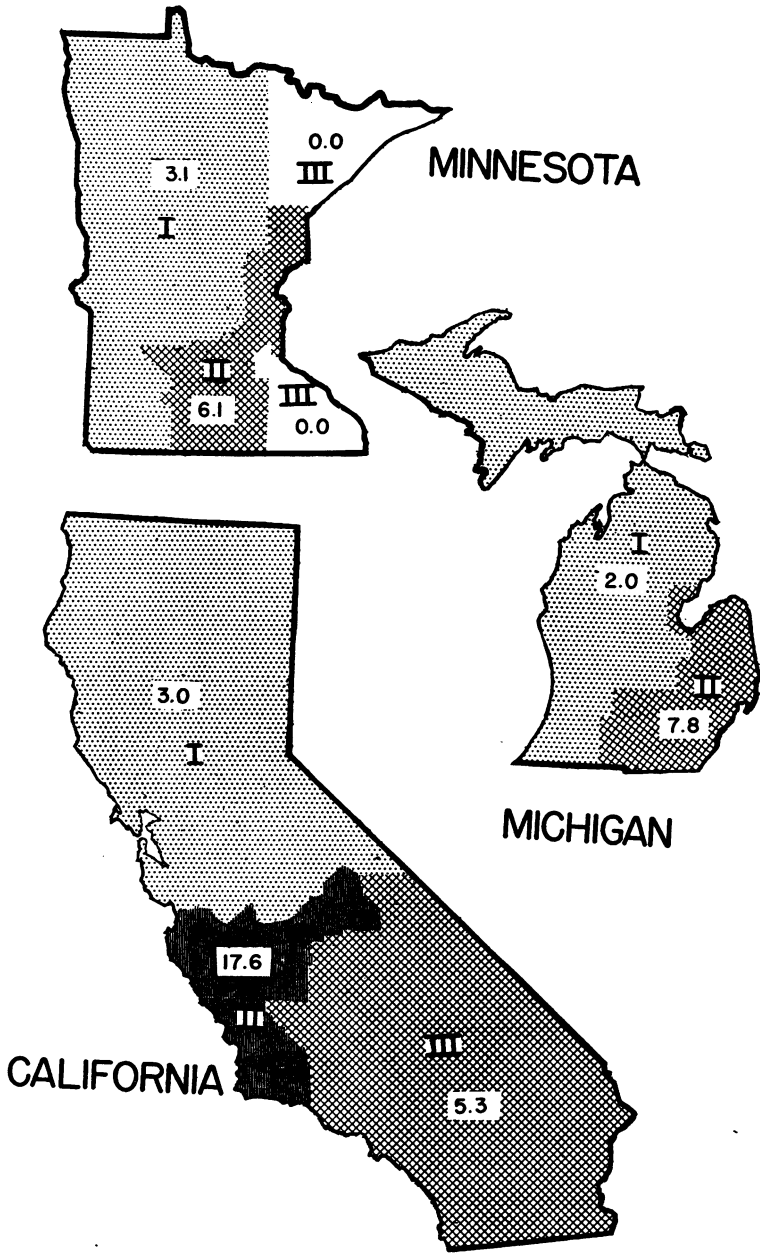


FIGURE 3.—Percentage of positive histoplasmin reactors among student nurses in certain States, classified by section of State of lifetime residence.

Minnesota, a State of very low prevalence of histoplasmin reactivity, had only 38 positive reactors among 934 lifetime residents. The greater part of the State showed an incidence of only 3.1 percent positive reactors; two sections, northeast and southeast, showed none; and an area containing Minneapolis and Northfield went up to 6.1 percent, resembling the situation in northern Iowa directly to the south.

#### SUMMARY

Analysis, according to place of residence, of the histoplasmin reactions of 8,141 student nurses in connection with a study of early tuberculosis leads to the conclusions: (a) That geography appears to be a very significant determining factor in the prevalence of positive reactors; (b) that an area of high prevalence of positive histoplasmin reactors exists in the eastern central part of the United States and (c) that the frequency of positive reactors, in general, decreases with increasing distance from this area.

#### ACKNOWLEDGMENT

The author is indebted to a number of persons for assistance in the preparation of this paper. Special thanks are due Dr. Charlotte Silverman and Virginia Trevett for their work on the histoplasmin tests and to Shirley Ferebee for her painstaking work on the statistical analysis. Since the paper forms one report on the cooperative study of minimal tuberculosis in student nurses being supported by the National Tuberculosis Association, special thanks are due Dr. William Charles White and the Medical Research Committee of the Association.

#### SPECIAL ACKNOWLEDGMENT

In the paper "Nontuberculous Pulmonary Calcifications and Sensitivity to Histoplasmin" (2), acknowledgment was made to other workers for suggestions and assistance, but a question has been raised as to the adequacy of some of these references. In this second paper on the subject, I wish to acknowledge unequivocally my indebtedness to many other workers in the field. To make this clear, the following brief history of my work on pulmonary calcification is presented.

My interest in the problem began in 1938, in a study involving tuberculin testing and chest X-ray examinations of about 7,000 school children in Hagerstown, Md. The results showed clearly that a large proportion of the pulmonary calcifications observed could probably not be caused by tuberculosis.

In 1940 I served as statistical consultant on a study subsequently

published by Aronson, et al., "Relationship of Coccidioidomycosis to Calcified Pulmonary Nodules" (4), which demonstrated that coccidioidomycosis is probably the cause of pulmonary calcifications in negative tuberculin reactors among Indian children in the southwestern States. It is to this association that I am most indebted both for the original stimulus to consider fungus infections in the study of pulmonary calcifications and for the methodology of showing the relationship by means of skin tests of persons living in different parts of the country.

During 1940 and 1941, in cooperation with Dr. M. L. Furcolow and Dr. W. E. Nelson, a study was undertaken at Xenia, Ohio, which included nearly 500 orphanage children. Some of the unpublished results of this work again emphasized the lack of correlation between tuberculin reactions and pulmonary calcification, but failed to show a relationship of calcification to coccidioidin reactions.

Next, a study of early tuberculosis in student nurses was undertaken in cooperation with the National Tuberculosis Association. Wide geographic coverage was considered important in order to collect data on the difficult problem of calcification in negative tuberculin reactors. A striking geographic distribution of this type of calcification was found. In the fall of 1944 coccidioidin tests on several hundred student nurses in many parts of the country eliminated coccidioidomycosis as the cause of calcification in the localities where this work was done; plans were then made to test for other fungi.

Correspondence with Dr. Amos Christie concerning this problem led to a visit to Vanderbilt University Medical School in February 1945. At that time he showed me the X-ray plates of a small number of patients with negative tuberculin and positive histoplasmin reactions, which he interpreted as suggesting that a mild or subclinical form of histoplasmosis might be causing pulmonary calcification in Tennessee. Although these results did not provide definitive evidence of a relationship they did constitute the reason for my trying histoplasmin next in our continuing Nation-wide study of nurses; the object of this study was to determine whether a statistically valid correlation could be demonstrated.

Dr. Christie kindly furnished histoplasmin for our study on student nurses, but subsequently requested that it be discarded because of contamination. Fortunately Dr. Chester Emmons of the National Institute of Health had some histoplasmin on hand which he generously furnished for this purpose so that the study could proceed as part of the scheduled spring skin-testing program of nurses. Dr. Emmons over the past several years has been very helpful to me and my colleagues as a consultant in mycology.

Though referred to in the previous paper, I should mention again the very special indebtedness of all of us working on this problem.

to Dr. C. E. Smith of Stanford University for the suggestion, published in 1943, that histoplasmosis might be the cause of pulmonary calcifications in negative tuberculin reactors in certain areas of the United States.

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## TUBERCULOSIS MORTALITY IN THE UNITED STATES AND IN EACH STATE: 1944<sup>1</sup>

By J. YERUSHALMY, *Principal Statistician, United States Public Health Service*, and I. M. MORIYAMA, *Senior Social Science Analyst, United States Bureau of the Census*

During the period of the war, there occurred in the United States more than two deaths from tuberculosis for every three lives lost in combat by the armed forces of the United States. Approximately 206,200 deaths from tuberculosis occurred during the 44 months of war, while the total battle deaths numbered approximately 280,000.<sup>2</sup> This comparison is not presented for the purpose of minimizing war losses, particularly since battle deaths occurred among the healthiest of the population with years of productive life ahead. However, it does serve to emphasize the fact that tuberculosis is still a major public health problem, despite the remarkable progress made in the control of this disease during the past several decades.

The decline in tuberculosis mortality was not interrupted during the war years. In the 3-year period preceding the war (1939-41), there were 181,288 deaths from tuberculosis as compared with 169,426 deaths during the 3-year period 1942-44, a decrease of 11,862, or 6.5 percent, in the number of tuberculosis deaths for the two periods. The number of deaths from tuberculosis in each of the years between 1942 and 1944 was fewer than for the preceding year. According to

<sup>1</sup> From the Tuberculosis Control Division, U. S. Public Health Service, and the Division of Vital Statistics, U. S. Bureau of the Census.

Grateful acknowledgment is made to Richard V. Kasius, Tuberculosis Control Division, U. S. Public Health Service, for his assistance in assembling and analyzing the material used in this paper.

<sup>2</sup> This figure was obtained from the offices of the Surgeons General of the War and Navy Departments. It includes all deaths in combat, deaths from injuries sustained in battle, and missing persons declared dead.

preliminary estimates for 1945, the number of tuberculosis deaths continued to decline.

The reduction in tuberculosis mortality has not been limited to any particular geographic area, but is apparent in the statistics for a great majority of the States. However, there were a few exceptions where the number of deaths in 1944 exceeded the average annual number for the prewar period, 1939-41. Moreover the rate of decline has not been uniform in all geographic areas, the decline for the New England and Middle Atlantic States being relatively small as compared with that for other geographic divisions.

This report presents an analysis of tuberculosis mortality statistics for 1944 for the United States and for each State. Because detailed data by age, race, and sex are not available for individual States, it is difficult to determine the significance of the changes in the crude rates from previous years. In addition, the evaluation of tuberculosis mortality in the United States during the war years has been complicated by the fact that a considerable number of the population has been overseas. Consequently, the statistics are not entirely comparable with those for previous years. For the country as a whole, tuberculosis mortality rates can be made more comparable by the inclusion of statistics for the armed forces overseas. However, for individual States considerable study on a local level is necessary for a more satisfactory evaluation of the data.

## **Tuberculosis Mortality in the United States**

### ***Tuberculosis Mortality in 1944***

There were 54,731 deaths from tuberculosis (all forms) recorded in the United States in 1944, a decrease of 4.0 percent from the corresponding number of 57,005 deaths in 1943. This decline may not be as significant as it appears because there was only a small reduction of 1.2 percent in the number of tuberculosis deaths in 1943 as compared with the number in 1942. However, the decline is substantial, even when the comparatively small decrease in 1943 is taken into consideration. The average annual number of deaths for the two years 1943 and 1944 is 3.1 percent fewer than the number in 1942. In 1942 there were 1,561, or 2.6 percent, fewer deaths from tuberculosis than in 1941, and the reduction in the latter year from 1940 amounted to 1,177 deaths, or 1.9 percent. The death rates for tuberculosis per 100,000 population were 41.3 in 1944, 42.6 in 1943, and 43.1 in 1942. The average annual rate for the 3-year period 1939-41 was 45.8 per 100,000 population.

These rates are based on deaths occurring in the United States and on estimates of the population residing within the continental limits of the United States, which exclude members of the armed forces serving outside the country. Beginning with 1943, the number of such



persons became sufficiently large so that their exclusion from the estimated population had a noticeable effect on the death rate for tuberculosis, especially among males of certain age groups.

The procedure of excluding the population overseas and the deaths occurring within this population in computing vital statistics rates may be satisfactory in the evaluation of mortality risks for many causes, especially for acute diseases. However, when applied to tuberculosis, the use of this procedure results in overstating the rates when compared with those for previous years, since it excludes a large population group for which the tuberculosis death rate is relatively low. A detailed discussion of this situation may be found in a previous report.<sup>3</sup>

Because of these changes in composition of the population in the continental United States during recent years, it is not possible now to obtain a measure of the risk of death from tuberculosis in the United States which is comparable with that for previous years. However, it is possible to obtain a more comparable measure by relating the deaths from tuberculosis occurring among all residents of the United States to the total resident population, irrespective of present location.

According to the records of the armed services, there were 164 deaths<sup>4</sup> from tuberculosis which occurred outside of the continental United States in 1944. The addition of these deaths to the 54,731 which occurred in the continental United States represents the total number of recorded tuberculosis deaths among the entire population of the United States, including armed forces overseas. The tuberculosis death rate on a *de jure* basis, or the rate for the entire resident population (including the armed forces overseas) in 1944 was 39.6 per 100,000 population as compared with the rate of 41.3 for the *de facto* population (excluding armed forces overseas). The former rate is more nearly comparable with the tuberculosis death rates for previous years. This *de jure* rate of 39.6 is 5.2 percent lower than the similarly computed *de jure* rate of 41.8 for 1943. The average *de jure* rate for the 3 war years was 41.4 per 100,000 population (including armed forces overseas), or 9.6 percent lower than the corresponding average rate of 45.8 for the prewar period 1939 to 1941, inclusive. This decline is in striking contrast to the experience of the war-torn countries where tuberculosis is reported to have assumed epidemic proportions.

Although tuberculosis death rates based on the total population, including armed forces overseas, are more meaningful for comparative

<sup>3</sup> *Tuberculosis mortality in the United States in 1945*, Vital Statistics-Special Reports, Vol. 21, No. 2, Apr. 10, 1945 (see p. 23-24).

<sup>4</sup> Data furnished by courtesy of the Surgeons General of the War and Navy Departments, respectively, show 150 tuberculosis deaths among Army personnel overseas, 9 deaths among Naval personnel overseas, and 5 deaths among Naval personnel aboard ship.

purposes than rates excluding the deaths and the population overseas, the basic tables given in this report relate only to deaths among the population present in the continental United States. This procedure is followed, since data for the armed forces are not yet available in the same detail as those for residents present in the United States. It is, therefore, not possible to compute comparable rates for all classifications, or for smaller geographic and political subdivisions of the country, such as States and local communities. Except where indicated, the tuberculosis death rates given in this report are based on the *de facto* population (excluding armed forces overseas). However, attention will be called to rates that appear to obscure the probable tuberculosis mortality situation.

***Tuberculosis Mortality Trend by Race and Sex: 1910-44***

In table 1 and figure 1 are presented the trends of tuberculosis mortality by race and sex during the period 1910 to 1944. Tuberculosis mortality has been declining at a relatively rapid rate through

TABLE 1.—*Death rates for tuberculosis (all forms), by race and sex: death-registration States, 1910-1944*

[Rates per 100,000 population]

Year	Total	White			Nonwhite		
		Total	Male	Female	Total	Male	Female
1944.....	41.3	33.7	45.0	23.3	106.2	122.7	91.3
1943.....	42.6	34.3	44.4	24.7	112.9	126.4	100.0
1942.....	43.1	34.4	43.3	25.6	118.4	131.4	106.0
1941.....	44.5	35.4	43.3	27.4	124.2	134.3	114.5
1940.....	45.8	36.5	44.7	28.2	127.6	138.7	116.9
1939.....	47.1	37.7	44.7	30.6	129.1	137.3	121.1
1938.....	49.1	39.1	46.2	31.9	136.8	144.0	129.8
1937.....	53.8	43.4	50.9	35.8	145.0	155.0	135.2
1936.....	55.9	45.0	52.2	37.6	151.6	163.9	139.6
1935.....	55.1	44.9	51.7	37.8	145.1	155.4	135.4
1934.....	56.7	46.2	52.7	39.6	148.8	156.9	140.8
1933.....	59.6	48.5	54.3	42.6	157.7	165.6	149.9
1932.....	62.5	50.2	55.9	44.4	173.5	179.5	167.5
1931.....	67.8	54.2	60.1	48.2	191.1	197.4	184.9
1930.....	71.1	57.7	63.4	51.9	192.0	194.3	189.8
1929.....	75.3	62.4	67.1	57.6	192.0	191.5	192.6
1928.....	78.3	64.9	69.7	59.9	199.5	199.4	199.6
1927.....	79.6	66.5	70.7	62.2	208.7	205.4	212.1
1926.....	85.5	72.0	76.4	67.5	223.8	221.5	226.1
1925.....	84.8	71.6	75.8	67.2	221.3	215.8	226.7
1924.....	87.9	74.9	79.3	70.4	218.6	215.0	222.3
1923.....	91.7	79.5	84.4	74.5	213.1	206.3	220.0
1922.....	95.3	82.6	87.5	77.4	218.9	216.6	221.2
1921.....	97.6	84.7	89.1	80.2	239.3	233.7	245.1
1920.....	113.1	99.5	104.1	94.8	262.4	255.4	269.6
1919.....	125.6	110.9	121.1	100.4	284.0	275.5	292.7
1918.....	149.8	134.3	153.2	115.4	346.0	351.0	340.9
1917.....	143.5	129.6	.....	.....	332.6	.....	.....
1916.....	138.4	125.7	141.3	109.5	322.7	322.3	323.0
1915.....	140.1	128.5	144.0	112.2	401.1	420.2	380.5
1914.....	141.7	130.3	146.9	112.9	396.7	417.8	374.0
1913.....	143.5	132.6	147.7	116.7	386.5	401.9	369.9
1912.....	145.4	136.0	149.4	121.8	429.0	459.9	394.5
1911.....	155.1	145.0	157.5	131.9	461.4	484.8	435.2
1910.....	153.8	145.9	158.2	132.8	445.5	479.3	406.8

this entire period, although the decline has been generally greater for females than for males, and for whites than for nonwhites.

In general, the rates were highest during the 35-year period for nonwhite males and lowest for white females. However, there was a period of 10 years between 1919 and 1928 when the rate for nonwhite females was the highest. Since 1929, the rate for nonwhite females has remained lower than that for nonwhite males, and the difference between the rates for the two sexes has been increasing. The rate of decline in tuberculosis mortality among nonwhite males since 1923 has been lower than that for the preceding 13-year period.

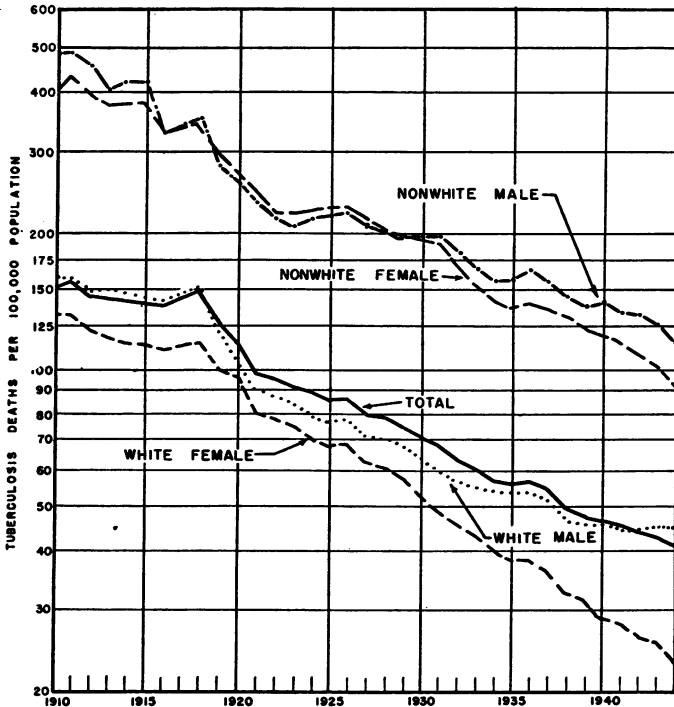


FIGURE 1.—Trend of death rates per 100,000 population for tuberculosis (all forms) by race and sex: Death registration States, 1910-44.

The tuberculosis death rate for white females has been declining almost continuously since 1918. The rate for white females in 1944 was about one-fifth of that in 1918. The rate of decline in tuberculosis mortality among white males has been smaller than that for white females, and beginning with 1938, the rate has almost levelled off. The tuberculosis death rates for white males in 1943 and 1944 actually indicate increases over the rates for the preceding year. However, part of these increases are only apparent and result from the exclusion of a relatively large number of men of military age serving overseas. Data are not available by race and sex, but the

death rates for males of all races based on data which includes the armed forces show an actual decrease from 50.9 in 1943 to 49.0 per 100,000 population in 1944. These rates may be contrasted with the corresponding *de facto* rates of 52.9 in 1943 and 53.1 per 100,000 population (excluding armed forces overseas) in 1944.

The average annual tuberculosis death rate for all males including the armed forces overseas for the war years, 1942-44, was 50.6 per 100,000 population as compared with the average rate of 53.5 for the prewar years, 1939-41. This decline of 5.4 percent in the average rate for males was considerably less than that of 15.3 percent for females. The rate for females decreased from 38.0 for the 3-year period, 1939-41, to 32.2 for the 3 war years.

One of the more striking changes in tuberculosis mortality is the relatively large decrease in the number of deaths among nonwhites in recent years. There were 2,274 fewer tuberculosis deaths in 1944 than in 1943. Of this number, nonwhites accounted for 1,023 and whites for 1,251. On a percentage basis these figures represent a decline of 6.5 percent in the number of tuberculosis deaths for nonwhites, and 3.0 percent in the number for whites.

#### *Age-Specific Death Rates by Race and Sex*

As mentioned before, the exclusion of statistics on the overseas population leads to an overstatement of the death rates for tuberculosis. This is especially true of the rate for males of military age. For example, the *de facto* rates for males age 20 to 29 in 1944 was 53.7. However, the *de jure* rate which more nearly approximates the true rate is 37.2<sup>5</sup> per 100,000 population (including armed forces overseas). Since the use of *de facto* data affects only the rates for males in a relatively narrow age range, the general configuration of the curves is not changed. However, caution should be exercised when comparisons are made with similar data for previous years in which rates for males of military age are involved.

The general form of the curves of tuberculosis mortality by age, race and sex (fig. 2 and table 2) for 1944 is much like that for previous years. In practically every age group the rate for nonwhites is much higher than that for whites. The rates for males, especially among whites, increase continuously with age (except for the very young) while those for females reach a peak early in adult life. The peak in mortality for nonwhite females is much higher than that for white females, and occurs between ages 20 and 24 years, while the corresponding one for white females occurs later, in the 30-34 year age group.

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<sup>5</sup> All of the 164 deaths from tuberculosis occurring overseas were assumed to have occurred in this age group.

During the period of adolescence and young adulthood, the rates are higher for females than for males. In the older age groups, the rates for males are much higher than the corresponding rates for females.<sup>6</sup>

Figure 3 presents a comparison of tuberculosis mortality by age and sex for the war and prewar years. Data for 1942-44 are on a *de jure* basis (including armed forces overseas). It may be seen that there has been a decline in the rate for every group except for males 65

TABLE 2.—Death rates and number of deaths for tuberculosis (*all forms*), by age, race, and sex: United States, 1939-41 average, 1942, 1943, and 1944

Race, sex, and year	All ages <sup>1</sup>	Age (in years)											
		Under 5	5-9	10-14	15-19	20-24	25-29	30-34	35-44	45-54	55-64	65-74	75 and over
Tuberculosis deaths per 100,000 population													
All races, both sexes:													
1944	41.3	12.3	3.1	4.6	22.1	48.4	50.3	48.6	51.6	59.9	69.4	77.2	72.8
1943	42.6	12.2	3.6	5.6	24.4	45.8	49.0	51.3	52.8	63.6	72.3	79.2	73.6
1942	43.1	14.0	3.9	6.1	24.5	46.3	50.6	52.1	54.9	63.8	70.3	77.5	74.1
1939-41	45.8	15.2	4.4	6.8	27.5	49.2	56.1	56.5	59.0	66.6	74.5	80.4	76.7
Male:													
1944	53.1	12.7	3.0	3.6	17.4	50.6	56.8	53.7	67.9	91.6	105.4	106.6	92.9
1943	52.9	12.6	3.7	4.4	19.5	42.0	48.9	55.7	68.6	95.4	107.5	108.1	90.8
1942	52.3	14.4	4.1	4.9	18.7	39.0	48.2	57.9	71.0	94.3	102.9	103.8	88.6
1939-41	53.5	15.5	4.6	5.2	20.0	40.4	51.0	59.8	74.1	95.8	105.8	105.0	88.6
Female:													
1944	30.5	11.8	3.2	5.6	26.4	47.0	46.0	44.2	36.3	27.9	32.2	49.0	55.4
1943	32.6	11.8	3.4	6.9	29.3	48.9	49.0	47.3	37.7	31.2	35.8	51.5	58.7
1942	34.0	13.6	3.7	7.5	30.4	53.1	52.8	46.7	39.2	32.4	36.4	51.9	61.5
1939-41	38.0	15.0	4.3	8.5	35.0	57.8	61.0	53.4	43.9	35.9	41.6	56.2	66.3
White, both sexes:													
1944	33.7	9.0	2.0	2.4	11.9	29.9	34.7	35.8	40.8	51.8	64.7	74.3	72.1
1943	34.3	9.0	2.4	2.9	12.6	27.8	34.1	37.5	41.8	54.8	66.6	75.6	73.4
1942	34.4	10.7	2.5	3.2	13.1	27.9	34.3	37.5	43.0	54.9	64.9	74.4	73.3
1939-41	36.5	10.9	2.8	3.6	14.8	30.7	38.6	41.4	46.1	57.4	69.3	77.4	76.2
Male:													
1944	45.0	9.1	2.0	1.9	9.0	31.3	39.4	39.1	54.3	80.2	99.3	103.1	90.8
1943	44.4	9.3	2.6	2.4	9.8	25.4	33.7	40.3	55.1	83.8	100.3	103.4	88.5
1942	43.3	10.6	2.7	2.7	10.3	22.9	31.8	41.4	56.5	82.7	96.0	99.3	86.0
1939-41	44.2	11.0	3.0	2.9	10.7	24.2	34.5	43.6	58.7	84.0	99.8	100.7	86.6
Female:													
1944	23.3	8.8	1.9	2.8	14.6	28.9	31.6	32.8	28.0	23.1	29.1	47.0	56.0
1943	24.7	8.7	2.3	3.4	15.4	29.7	34.4	35.0	28.9	25.1	31.9	49.0	60.2
1942	25.6	10.7	2.3	3.6	15.9	32.6	36.6	33.7	29.7	26.2	32.7	50.4	62.1
1939-41	28.7	10.9	2.7	4.3	18.9	37.0	42.5	39.3	33.5	29.3	37.6	54.7	67.1
Nonwhite, both sexes:													
1944	106.2	35.9	10.0	20.4	97.9	188.9	174.5	156.1	147.0	145.4	130.2	118.4	81.4
1943	112.9	35.1	10.9	25.0	114.4	184.7	168.5	168.0	149.7	157.5	144.4	131.9	76.7
1942	118.4	37.6	13.2	27.6	113.1	194.9	185.3	180.5	159.2	160.5	139.2	122.0	85.8
1939-41	127.1	45.5	15.4	30.7	129.1	203.0	201.5	191.0	171.8	167.8	139.0	123.4	83.6
Male:													
1944	122.7	38.5	8.9	15.5	80.2	188.1	195.9	180.2	191.5	212.3	181.1	154.2	120.8
1943	126.4	36.9	11.4	18.9	94.0	166.1	173.2	189.2	190.6	219.0	195.1	171.0	121.0
1942	131.4	41.7	13.5	20.5	84.6	172.5	190.3	206.4	201.9	220.6	187.0	165.1	123.7
1939-41	137.0	47.4	16.2	22.2	96.8	183.6	195.3	208.5	213.2	225.0	178.2	164.7	116.2
Female:													
1944	91.3	33.2	11.0	25.3	114.3	189.5	160.2	136.6	107.5	78.6	74.1	79.9	47.9
1943	100.0	33.3	10.4	31.1	134.1	200.6	164.7	149.5	112.4	95.1	88.0	89.9	38.8
1942	106.0	33.6	12.9	34.6	140.7	214.5	181.1	157.2	119.8	98.8	85.9	75.6	53.2
1939-41	117.5	43.5	14.6	39.1	159.7	219.8	207.0	174.9	132.7	107.5	94.7	78.6	55.0

See footnote at end of table.

<sup>6</sup> In 1939-41, the death rate curve for males crossed that for females at age 30 years for whites, at about 29 years for nonwhites. In figure 2 the corresponding ages may be seen to be somewhat earlier. However, this apparent shift is the result of the overstatement of the death rates for males in the age group 20-29 years as discussed above. When rates on a *de jure* basis are used, the relative position of the curves for 1944 becomes much like that for 1939-41.

TABLE 2.—Death rates and number of deaths for tuberculosis (all forms), by age, race, and sex: United States, 1939-41 average, 1942, 1943, and 1944—Con.

Race, sex, and year	All ages <sup>1</sup>	Age (in years)											
		Under 5	5-9	10-14	15-19	20-24	25-29	30-34	35-44	45-54	55-64	65-74	75 and over
Number of deaths from tuberculosis													
<b>All races, both sexes:</b>													
1944	54, 731	1, 550	342	496	2, 498	4, 831	4, 884	4, 995	9, 734	9, 707	8, 174	5, 316	2, 161
1943	57, 005	1, 477	389	617	2, 894	5, 048	5, 215	5, 344	9, 938	10, 223	8, 306	5, 359	2, 131
1942	57, 690	1, 590	420	692	2, 967	5, 347	5, 595	5, 461	10, 267	10, 175	7, 884	5, 139	2, 091
1939-41	60, 429	1, 613	475	799	3, 388	5, 719	6, 236	5, 811	10, 846	10, 373	7, 960	5, 104	2, 052
<b>Male:</b>													
1944	33, 717	816	168	197	949	1, 060	2, 212	2, 548	6, 207	7, 455	6, 308	3, 591	1, 279
1943	34, 786	776	206	244	1, 147	2, 073	2, 380	2, 763	6, 325	7, 744	6, 286	3, 584	1, 221
1942	34, 801	831	223	278	1, 132	2, 150	2, 557	2, 954	6, 564	7, 635	5, 884	3, 390	1, 164
1939-41	35, 433	831	251	306	1, 234	2, 306	2, 782	3, 038	6, 803	7, 650	5, 786	3, 308	1, 109
<b>Female:</b>													
1944	21, 014	734	174	299	1, 549	2, 871	2, 672	2, 447	3, 527	2, 252	1, 866	1, 725	882
1943	22, 219	701	183	373	1, 747	2, 975	2, 835	2, 581	3, 613	2, 479	2, 020	1, 775	910
1942	22, 889	759	197	414	1, 835	3, 197	3, 038	2, 607	3, 703	2, 540	2, 000	1, 749	927
1939-41	24, 996	782	224	493	2, 154	3, 413	3, 454	2, 773	4, 043	2, 723	2, 174	1, 796	943
<b>White, both sexes:</b>													
1944	39, 958	995	193	221	1, 185	2, 632	2, 996	3, 287	6, 909	7, 666	7, 066	4, 785	1, 991
1943	41, 209	955	231	277	1, 318	2, 707	3, 231	3, 499	7, 050	8, 052	7, 101	4, 778	1, 977
1942	41, 306	1, 056	234	314	1, 403	2, 869	3, 381	3, 522	7, 213	8, 004	6, 845	4, 613	1, 926
1939-41	43, 282	1, 014	265	372	1, 617	3, 180	3, 828	3, 827	7, 605	8, 183	6, 765	4, 596	1, 904
<b>Male:</b>													
1944	25, 596	518	101	93	431	1, 065	1, 364	1, 665	4, 476	5, 966	5, 500	3, 233	1, 163
1943	26, 162	502	123	116	509	1, 104	1, 462	1, 795	4, 570	6, 224	5, 429	3, 194	1, 109
1942	25, 899	536	128	138	556	1, 127	1, 512	1, 906	4, 704	6, 123	5, 077	3, 021	1, 054
1939-41	26, 350	520	141	152	599	1, 239	1, 690	2, 000	4, 848	6, 143	5, 042	2, 955	1, 013
<b>Female:</b>													
1944	14, 362	477	92	128	754	1, 567	1, 632	1, 622	2, 433	1, 700	1, 566	1, 552	828
1943	15, 047	453	108	161	809	1, 603	1, 769	1, 704	2, 480	1, 828	1, 672	1, 584	868
1942	15, 407	520	106	176	847	1, 742	1, 869	1, 616	2, 509	1, 881	1, 668	1, 592	872
1939-41	16, 932	494	124	220	1, 023	1, 941	2, 138	1, 827	2, 757	2, 040	1, 823	1, 641	891
<b>Nonwhite, both sexes:</b>													
1944	14, 773	555	149	275	1, 313	2, 199	1, 888	1, 708	2, 825	2, 041	1, 108	531	170
1943	15, 796	522	158	340	1, 576	2, 341	1, 984	1, 845	2, 858	2, 171	1, 205	581	154
1942	16, 384	534	186	378	1, 564	2, 478	2, 214	1, 939	3, 054	2, 171	1, 139	526	165
1939-41	17, 147	599	210	427	1, 771	2, 539	2, 408	1, 984	3, 241	2, 190	1, 095	508	148
<b>Male:</b>													
1944	8, 121	298	67	104	518	895	848	883	1, 731	1, 489	808	358	116
1943	8, 624	274	83	128	638	969	918	963	1, 755	1, 520	857	390	112
1942	8, 902	295	95	140	576	1, 023	1, 045	1, 048	1, 860	1, 512	807	369	110
1939-41	9, 083	311	110	154	645	1, 067	1, 092	1, 038	1, 955	1, 507	744	353	96
<b>Female:</b>													
1944	6, 652	257	82	171	795	1, 304	1, 040	825	1, 094	552	300	173	54
1943	7, 172	248	75	212	938	1, 372	1, 066	877	1, 133	651	348	191	42
1942	7, 482	239	91	238	988	1, 455	1, 169	891	1, 194	659	332	157	55
1939-41	8, 064	288	100	273	1, 126	1, 472	1, 316	946	1, 286	683	351	155	52

<sup>1</sup> Includes ages not stated.

years and over. This increase appears significant in view of the decline in the tuberculosis death rate for males in the age group 65 years and over for a long-time period prior to the war. In the younger ages, the absolute decrease in the death rates for males in the age groups between 5 and 14 years and between 20 and 45 years appears to be more marked than in the other ages. On a relative basis, there was a decrease of 10 percent or more in the death rate for every group between 5 and 34 years. The greatest decline of 21.7 percent occurred in the rate for males 10 to 14 years of age.

The decline in tuberculosis mortality among females during the two periods, 1939 to 1941 and 1942 to 1944, was considerably greater than for males. There was a decrease in the death rate for every

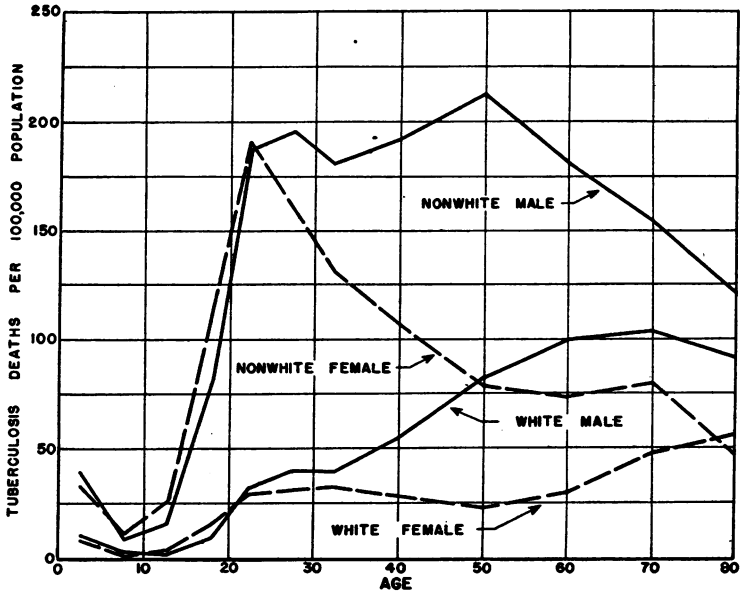


FIGURE 2.—*De facto* death rates per 100,000 population (excluding armed forces overseas) for tuberculosis (all forms) by age, race, and sex: United States, 1944.

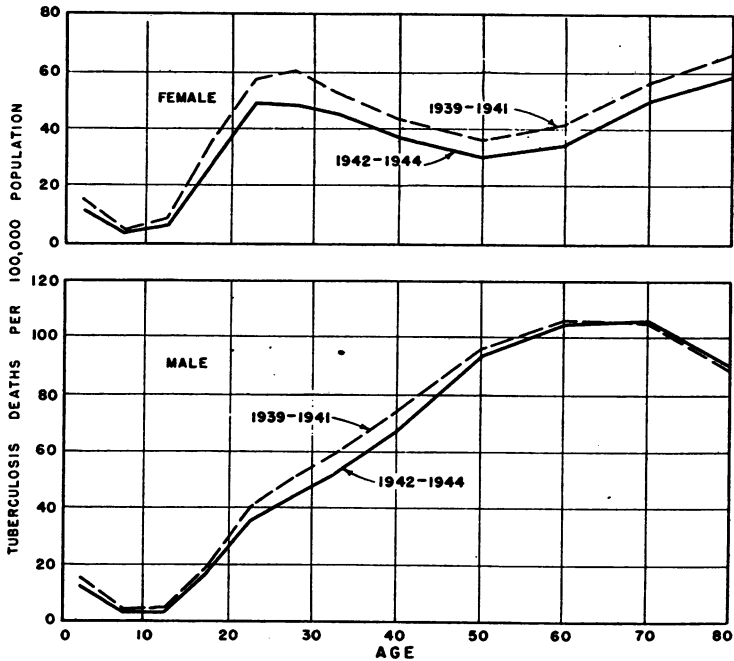


FIGURE 3.—*De jure* death rates per 100,000 population (including armed forces overseas) for tuberculosis (all forms) by age and sex: United States, 1939-41 and 1942-44 averages.

group, the greatest decline occurring in the case of males in the 10–14 year age group (21.2 percent). The decrease in the rate for every age group, except one, was greater than 10 percent. The smallest change in the death rate was 9.6 percent and occurred in the rate of females 65 to 74 years.

It is also significant that there has been a change in the age at which the first peak in mortality for females occurs. In the prewar period, 1939–41, the peak in the mortality curve came within the 25–29 year age range. As a result of the large reduction in the rate for this group, the peak in the rate appears earlier (20–24 year age group) during 1942–44.

#### *Proportionate Mortality by Age, Race, and Sex*

Figure 4 shows the proportionate mortality, or the number of deaths from tuberculosis out of every 100 deaths from all causes, for 1944, by age for the four race-sex groups. These ratios do not measure the risk of death from tuberculosis but indicate the relative importance of tuberculosis as a cause of death. Since both the numerator and denominator of the ratios are affected approximately to the

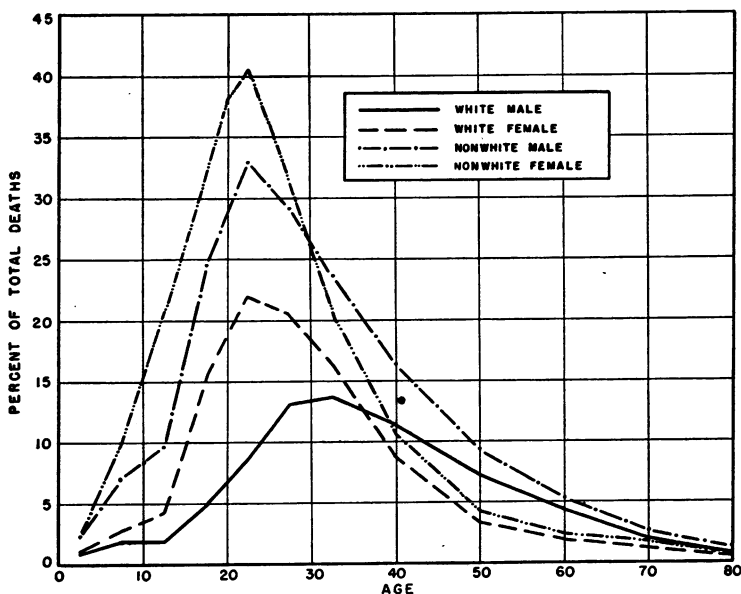


FIGURE 4.—Deaths from tuberculosis (all forms) as percentages of deaths from all causes, by age, race, and sex: United States, 1944.

same degree by the exclusion of statistics for the armed forces overseas, the proportionate mortality from tuberculosis is affected to a much less extent by the removal of men for overseas duty than are *de facto*



death rates. In the absence of *de jure* rates, these ratios may be used to supplement the *de facto* rates in determining the extent and direction of changes in tuberculosis mortality relative to total mortality.

The shapes of the proportionate mortality curves given in figure 4 for 1944 are very similar to those for previous years. The peaks in each curve and the points at which the curves cross each other occur almost exactly at the same age groups as in previous years. These curves differ in shape from the death rate curves given in figure 3 in that the peaks occur earlier for each race-sex group.

It may be seen from figure 4 that tuberculosis represents a mortality problem of considerable magnitude among young adults. For example, over 40 percent of all deaths among nonwhite females 20 to 24 years of age occurring in 1944 were attributed to tuberculosis; 33 percent of the total deaths among nonwhite males between 20 and 24 years were recorded as tuberculosis deaths; 22 percent of the deaths from all causes reported for white females 20 to 24 years were from tuberculosis; and tuberculosis deaths represented 14 percent of all deaths of white males 30 to 34 years.

#### *Distribution of Tuberculosis Deaths by Age*

For purposes of control activities, it is useful to know the age groups in which the tuberculosis deaths are concentrated. Although the death rate for tuberculosis increases with age, as shown in figure 2, it does not follow that the number of tuberculosis deaths is more numerous in the older ages because there are fewer people in these ages. Actually, the number of tuberculosis deaths is greatest in the 20-44 year age group where 44.7 percent of all tuberculosis deaths occurred. As may also be seen from table 3, nearly one-third of all deaths from tuberculosis occurred among persons between the ages of 45 and 64 years.

TABLE 3.—Percent distribution of tuberculosis deaths, by age and sex: United States, 1944

Age groups	Total	Male	Female
All ages <sup>1</sup> .....	100.0	61.6	38.4
Under 20 years.....	8.9	3.9	5.0
20-44 years.....	44.7	23.6	21.0
45-64 years.....	32.7	25.1	7.5
65 years and over.....	13.7	8.9	4.8

<sup>1</sup> Includes ages not stated.

The age distribution of tuberculosis deaths is different for males than for females. Among males there were nearly as many deaths in the 20-44 year age group as in the age group 45 to 64 years, while there were about three times as many tuberculosis deaths among

females aged 20 to 44 years as there were in the age group 45 to 64 years.

Because of the aging of the population and also because the tuberculosis death rate has been declining faster for the younger than for the older age groups in the population, there has been a consistent change in the percent distribution of tuberculosis deaths. As may be seen from figure 5, the deaths in the youngest age group (under 20 years) represented 16.9 percent of all tuberculosis deaths in 1919-21; 14.4 percent in 1929-31; 10.4 percent in 1939-41; 9.6 percent in 1942-43; and 8.9 percent in 1944. Similarly, for the age group 20 to 44

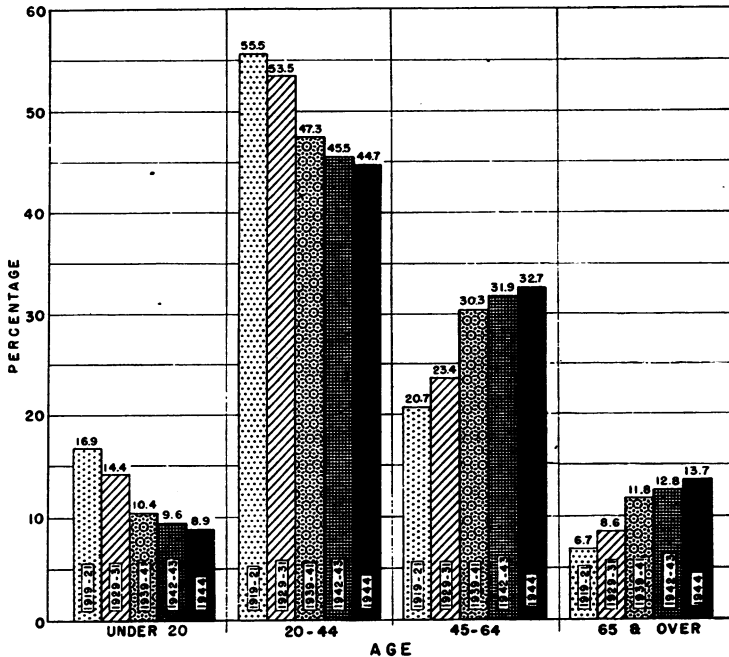


FIGURE 5.—Percent distribution of deaths from tuberculosis (all forms) by age: United States, 1919-21, 1929-31, 1939-41, 1942-43 averages, and 1944.

years, the percentage dropped from 55.6 percent in 1919-21 to 44.7 percent in 1944. On the other hand, the percentage of tuberculosis deaths for the age group 45 to 64 years has been increasing. In the age group 65 years and over, the percentage has been doubled within the last two decades.

**Tuberculosis Mortality Among War Veterans**

Tuberculosis ranks high as a problem in the medical care of war veterans. This problem was fully recognized in the years following the first world war, and special facilities were provided for the care of veterans with tuberculosis.

In order to minimize the tuberculosis problem among veterans of World War II, the Selective Service System and the armed forces utilized the recent developments in photofluorography for screening out the frank and potential tuberculous cases from the services. In view of this screening process and because of the decline in the tuberculosis rate, it may be anticipated that the tuberculosis rate among World War II veterans will be much lower than that for the veterans of World War I. However, in terms of the large number of veterans involved, tuberculosis will no doubt continue to be a problem of considerable magnitude.

Since the beginning of World War II, there have already been over 17,000 separations from the armed forces because of tuberculosis. During the period December 7, 1941, to December 31, 1944, there were 10,863 separations from the Army due to tuberculosis. In almost the same period (1942-44, inclusive) there were 5,898 separations from service in the Navy for the same cause.

In 1944 there was a total of 981 tuberculosis deaths among veterans of World War II occurring in the United States. Deaths among veterans of World War II amount, at the present time, to slightly less than one-third of the number of tuberculosis deaths among World War II veterans, of which there were 3,009. The total number of tuberculosis deaths among veterans of all wars in 1944 was 4,370.

As may be seen from table 4, the great majority of the 1944 deaths among veterans occurred in institutions, and of these the majority were in Federal institutions, primarily in hospitals of the Veterans Administration and in station and shore hospitals of the Army and Navy.

TABLE 4.—*Number of deaths from tuberculosis (all forms) among war veterans in institutions by type of control: United States, 1944*

Type of control	Total	World War I	World War II	World Wars I and II	Other wars
Total.....	4,370	3,009	974	7	380
Deaths not in institutions.....	608	456	105	0	47
Deaths in institutions.....	3,762	2,553	869	7	333
Type of control:					
Federal.....	2,889	1,858	757	5	269
State.....	146	100	24	0	22
City and county.....	491	411	49	0	31
Nonprofit.....	193	151	30	2	10
Proprietary and unknown.....	43	33	9	0	1

The proportion of tuberculosis deaths occurring in institutions in 1944 was much higher among veterans (86.1) than among the general population (64.0). It was slightly higher for World War II veterans (89.3 percent) than among veterans of World War I (84.8).

### Tuberculosis Mortality by States

The tuberculosis death rate for individual States varies over a wide range. The lowest rate in 1944 was 12.0 per 100,000 population reported for residents of the State of Utah. The highest rate, more than 10 times that of the lowest, was 122.9 for Arizona. The rates for these two States, Utah and Arizona, were also the lowest and highest, respectively, in 1943. One-fourth of the States had rates of less than 32; one-half of them recorded rates of less than 38.3 and the rates in the top one-fourth of the States was 45 per 100,000 population or higher.

The geographic distribution of the tuberculosis death rate in 1944 was much like that of previous years. In general, two large bands of low and high tuberculosis mortality may be noted in figure 6. The

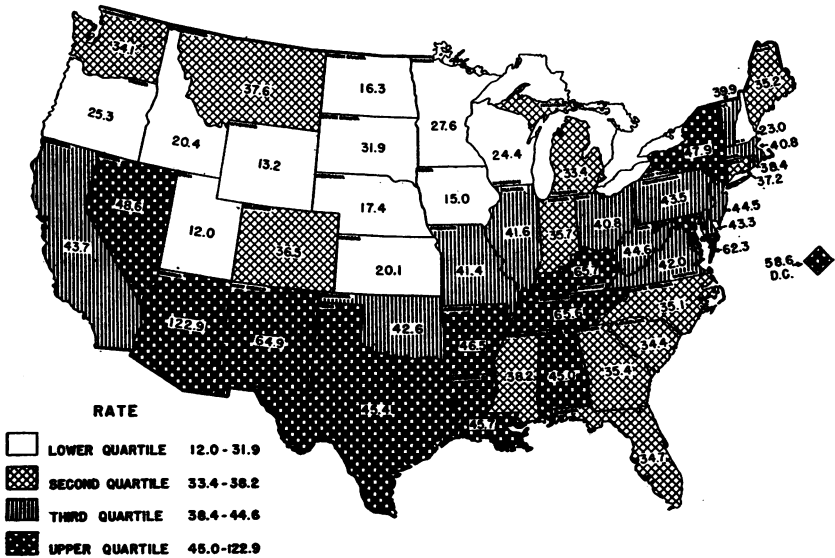


FIGURE 6.—Death rates per 100,000 population for tuberculosis (all forms): Each State, 1944.

area of relatively low mortality extends from the Pacific Northwest to Wisconsin. New Hampshire is the only other State falling in the lower quartile. The area of relatively high tuberculosis mortality stretches across the southern part of the United States from Nevada to Kentucky. The other States in the upper quartile are Maryland and New York. (The District of Columbia was also in the upper quartile.)

The geographic differences in tuberculosis mortality are not all easily explainable. Not all of the variations in these rates reflect real differences in the force of tuberculosis mortality as influenced by environmental and other conditions, by efforts exerted in the control

of the disease, and by facilities available for the care of the tuberculous. Part of the differences in the rates may only be apparent and result from variations in the accuracy of diagnosis and completeness with which tuberculosis deaths are reported. In addition, the crude death rate is greatly affected by the age, race, and sex composition of the population. Data on population composition required for a more satisfactory evaluation of these differences are not available for 1944. Ordinary methods of estimating the population according to these factors are not valid for the war years in view of the unprecedented population movement and the complication arising from the fact that a relatively large proportion of the population of the different States was serving in the armed forces overseas and in other parts of the country.

#### *Comparison of Tuberculosis Mortality in 1944 With Previous Years*

Table 5 presents the number of deaths from tuberculosis for each State in each of the 3 war years, 1942, 1943, and 1944, the average annual number of deaths for the prewar period, 1939-41 and the death rates per 100,000 population for the same periods. In addition, there are presented percent changes in the rates from 1943 to 1944, from 1939-41 to 1944, as well as from the average annual prewar rate to the average annual rate for the 3 war years, 1942-44.

It may be seen that the decrease in the rate in 1944, compared with 1943, has been rather general and occurred in a large number of States. In 31 States and in the District of Columbia, the rate for 1944 was lower than for 1943; in 16 there has been an increase in the rate; and in one the rates for the two years were the same. In evaluating the percent changes in the rates, it is important to bear in mind that crude rates are affected by changes in the age-race-sex composition of the population, but these changes are not reflected by the estimated populations on which the rates are based. For example, the populations of States containing large numbers of military camps will be augmented by a selected group of healthy males in an age group for which the mortality is relatively low. Moreover, yearly fluctuations in the rates for States may, in some cases, be insignificant, and in others, they may be dependent on large changes in the rate which may have occurred in previous years. In other words, a small increase following a stationary or rising rate may be more significant than a much larger increase which is preceded by a relatively large decrease in the rate.

It may be well to consider in addition, the differences in the actual number of deaths over a period of years. There were 10 States that recorded more deaths in 1944 than the average number for the period 1939-41. In 1944 there were 784 deaths recorded for residents of Arizona, as compared with an average annual number of 724 deaths

for the period 1939-41. Connecticut reported 661 deaths in 1944 and an average annual number of 616 in 1939-41. The corresponding figures for Rhode Island were 300 and 265. Other States with more deaths in 1944 than the average annual number in 1939-41 were

TABLE 5.—Number of deaths from tuberculosis (all forms), death rates and percent changes in rates, by State: United States, 1939-41 average, 1942, 1943, and 1944

[By place of residence]

Area	Number of deaths				Rate per 100,000 population				Percent change in rates		
	1944	1943	1942	1939-41 average	1944	1943	1942	1939-41 average	1943 to 1944	1939-41 to 1944	1939-41 to 1942-44
United States..	54,731	57,005	57,690	60,429	41.3	42.6	43.1	45.8	-3.1	-9.8	-7.6
Alabama.....	1,269	1,302	1,285	1,518	45.0	45.0	43.7	53.4	0	-15.7	-16.5
Arizona.....	784	690	675	724	122.9	98.2	122.7	144.3	+25.2	-14.8	-21.3
Arkansas.....	826	959	1,029	1,009	46.5	50.2	52.0	51.7	-7.4	-10.1	-3.9
California.....	3,826	3,872	3,876	3,838	43.7	45.7	50.5	55.1	-4.4	-20.7	-15.6
Colorado.....	419	471	495	503	36.5	40.5	44.6	44.7	-9.9	-18.3	-9.4
Connecticut.....	661	621	633	616	37.2	34.9	35.5	35.9	+6.6	+3.6	0
Delaware.....	123	111	146	152	43.3	39.5	52.3	56.9	+9.6	-23.9	-20.9
District of Columbia..	547	533	551	548	58.6	59.9	63.7	80.0	-2.2	-26.8	-24.1
Florida.....	823	855	870	944	34.7	36.1	40.7	49.4	-3.9	-29.8	-24.9
Georgia.....	1,141	1,332	1,295	1,510	35.4	41.3	40.2	48.2	-14.3	-26.6	-19.1
Idaho.....	109	93	86	99	20.4	18.7	18.0	18.8	+9.1	+8.5	+1.6
Illinois.....	3,218	3,349	3,338	3,663	41.6	43.5	41.6	46.3	-4.4	-10.2	-8.6
Indiana.....	1,221	1,248	1,261	1,398	35.7	36.7	36.7	40.7	-2.7	-12.3	-10.6
Iowa.....	341	395	427	450	15.0	17.0	17.6	17.7	-11.8	-15.3	-6.2
Kansas.....	357	345	438	423	20.1	19.4	25.0	23.6	+3.6	-14.8	-8.9
Kentucky.....	1,726	1,785	1,841	1,961	65.7	65.3	66.0	68.7	+6	-4.4	-4.5
Louisiana.....	1,158	1,290	1,211	1,347	45.7	50.5	47.5	56.8	-9.5	-19.5	-15.7
Maine.....	279	275	258	268	35.2	33.6	31.2	31.7	+4.8	+11.0	+5.0
Maryland.....	1,326	1,277	1,311	1,268	62.3	61.0	65.7	69.4	+2.1	-10.2	-9.2
Massachusetts.....	1,668	1,819	1,630	1,623	40.8	42.7	37.5	37.6	-4.4	+8.5	+7.2
Michigan.....	1,814	1,869	1,891	1,828	33.4	34.5	34.2	34.7	-3.2	-3.7	-2.0
Minnesota.....	693	719	693	758	27.6	27.9	26.0	27.1	-1.1	+1.8	+4
Mississippi.....	831	912	1,113	1,074	38.2	40.9	50.0	49.0	-6.6	-22.0	-12.2
Missouri.....	1,487	1,659	1,574	1,783	41.4	44.2	41.4	47.1	-6.3	-12.1	-10.0
Montana.....	175	206	201	235	37.6	42.5	39.0	42.0	-11.5	-10.5	-5.5
Nebraska.....	211	208	180	225	17.4	16.9	14.5	17.1	+3.0	+1.8	-4.7
Nevada.....	76	89	80	70	48.6	62.1	58.9	63.7	-21.7	-23.7	-11.8
New Hampshire.....	105	136	102	133	23.0	29.5	21.1	27.0	-22.0	-14.8	-9.3
New Jersey.....	1,856	1,932	1,882	1,852	44.5	45.6	44.0	44.4	-2.4	+2	+7
New Mexico.....	345	353	303	357	64.9	66.1	57.3	66.8	-1.8	-2.8	-6.1
New York.....	6,055	6,335	6,073	6,244	47.9	49.3	46.8	46.3	-2.8	+3.5	+3.7
North Carolina.....	1,239	1,366	1,461	1,598	35.1	37.5	41.0	44.6	-6.4	-21.3	-15.0
North Dakota.....	86	123	121	127	16.3	22.7	20.7	19.8	-28.2	-17.7	+5
Ohio.....	2,787	2,793	2,846	2,913	40.8	40.6	41.0	42.1	+5	-3.1	-3.1
Oklahoma.....	880	932	982	1,104	42.6	43.0	44.4	47.3	-9	-9.9	-8.5
Oregon.....	307	271	299	307	26.3	21.9	27.3	28.1	+15.5	-10.0	-12.1
Pennsylvania.....	4,020	4,080	4,187	4,231	43.5	43.1	43.0	42.7	+9	+1.9	+1.2
Rhode Island.....	300	296	280	265	38.4	39.4	37.8	37.1	-2.5	+3.5	+4.0
South Carolina.....	660	689	805	876	34.4	35.3	39.9	45.9	-2.5	-25.1	-2.6
South Dakota.....	178	176	185	197	31.9	30.5	31.6	30.7	+4.6	+3.9	+2.0
Tennessee.....	1,881	1,980	2,082	2,298	65.6	66.9	70.8	78.6	-1.9	-16.5	-13.7
Texas.....	3,126	3,338	3,611	3,814	45.4	47.9	53.9	59.4	-5.2	-23.6	-17.5
Utah.....	73	71	82	86	12.0	11.2	14.2	15.5	+7.1	-22.6	-20.0
Vermont.....	124	119	112	144	39.9	36.3	32.8	40.1	+9.9	-5	-9.7
Virginia.....	1,344	1,449	1,632	1,628	42.0	47.1	54.0	60.5	-10.8	-30.6	-21.3
Washington.....	702	720	676	689	34.1	35.4	35.8	39.6	-3.7	-13.9	-11.4
West Virginia.....	764	769	765	880	44.6	43.8	41.6	46.1	+1.8	-3.3	-6.1
Wisconsin.....	726	776	759	806	24.4	25.8	24.3	25.6	-5.4	-4.7	-3.1
Wyoming.....	34	37	37	45	13.2	14.5	14.7	18.0	-9.0	-26.7	-21.1

Idaho, Maine, Maryland, Massachusetts, Nevada, New Jersey, and Washington.

It is difficult to evaluate the changes in the tuberculosis death rate for individual States from data available on a national level. Knowledge of local conditions oftentimes will assist in a better understanding of the changes that may be taking place in tuberculosis mortality. However, certain information is available also on a national level, which may be of some value in interpretation. This additional information consists of the deaths from all causes which occurred among residents of different States. By correlating deaths from tuberculosis to the total number of deaths from all causes, it is possible to supplement the information obtained from a study of the death rates and to determine whether the changes in tuberculosis mortality have differed from those of total mortality. Although the presentation of the complete analysis for all States on this basis is beyond the scope of this paper, it is thought desirable to illustrate this method for the two States which showed the largest percentage change from 1943 to 1944 with the hope that they may serve as a guide for the analysis of data for other States. The States are Arizona, in which there was the largest increase (25.2 percent) in the rate from 1943 to 1944, and North Dakota, which recorded the largest decrease (28.2 percent) in the rate.

Tuberculosis was the cause of 784 deaths in Arizona during 1944, an increase of 94, or 13.6 percent, over that in 1943. During the same period there was also an increase of 4.7 percent in the number of deaths from all causes. Since the percentage increase in the number of tuberculosis deaths has been greater than that for all causes, it would appear that facts other than possible numerical increases in the population have contributed to the increase in tuberculosis mortality. In order to determine whether this increase has resulted from a change in the race-sex composition of the population, it is helpful to review the distribution of total deaths according to race and sex. It may be seen from table 6 that there has been an increase in the proportion of nonwhite deaths from 19 percent in 1943 to 21 in 1944. This increase for nonwhites was accompanied by a decrease

TABLE 6.—*Percent distribution of deaths from all causes by race and sex groups: Arizona, 1944 and 1943*

Race and sex groups	Percent distribution of deaths from all causes	
	1944	1943
Total.....	100.0	100.0
White male.....	51.9	51.9
White female.....	27.0	29.1
Nonwhite male.....	12.0	10.9
Nonwhite female.....	9.1	8.1

among white females. Since the tuberculosis mortality rate is higher among nonwhites, and generally lower for females, it indicates that a small part of the increase in the tuberculosis death rate may be due to a change in the race-sex composition of the population.

The next point to investigate is whether or not the increase in tuberculosis mortality has resulted from a change in the age structure of the population. This may be done by determining for each age-race-sex group, the proportion of total deaths which was due to tuberculosis for the 2 years 1944 and 1943. If the increase in the crude tuberculosis death rate is due to a change in the age composition of the population, the age specific death ratios may be expected to remain practically the same over the 2 years. If the ratios for 1944 are higher than the corresponding figures for 1943, the indications are that the course of tuberculosis mortality has been less favorable than that of the total death rate.

As may be seen from table 7, the increase in proportionate mortality for tuberculosis has not been general in all age-race-sex groups. There

TABLE 7.—Deaths from tuberculosis (all forms) as percentages of deaths from all causes, by age, race, and sex: Arizona, 1942-44

Race, sex, and year	All ages	Age			
		Under 15 years	15-44 years	45-64 years	65 years and over
<b>White male:</b>					
1944.....	12.0	2.4	20.6	20.2	3.1
1943.....	11.4	1.8	25.3	17.4	3.7
1942.....	11.6	1.9	26.2	17.1	3.3
<b>White female:</b>					
1944.....	8.8	4.0	29.3	7.3	1.2
1943.....	9.0	2.6	33.7	5.5	2.1
1942.....	8.6	2.8	28.9	8.4	1.5
<b>Nonwhite male:</b>					
1944.....	18.2	8.1	40.1	14.9	9.4
1943.....	15.0	6.4	34.2	17.5	9.1
1942.....	16.8	10.8	32.0	18.3	7.9
<b>Nonwhite female:</b>					
1944.....	20.1	14.7	40.3	9.5	10.7
1943.....	18.4	7.3	52.7	12.7	5.3
1942.....	21.6	15.9	39.8	20.3	6.8

has been some increase for whites under 15 years, and in the age group 45-64 years. This is true for both sexes. However, at the same time, there has been a reduction in the ratios for both sexes in the age groups 15-44, and 65 years and over. Among nonwhite males, on the other hand, there were considerable increases in the ratios for age groups under 15, and 15-44, a small increase for the age group 65 years and over, and a slight reduction for the 45-64 year age group. Among nonwhite females increases were recorded only for the youngest and the oldest age groups, with a reduction in the ratios for those between 15 and 64 years. This analysis of the death ratios suggests that the increase in tuberculosis mortality in Arizona has not been



as alarming as may be implied from the 25-percent increase in the death rate. It is very likely that a large part of the increase is only apparent and results from considerable changes in the age-race-sex structure of the population. There were, however, some real increases in tuberculosis mortality as compared with total mortality among nonwhite males.

In a similar manner the decrease in the death rate for North Dakota may be analyzed. In 1944 there were 86 deaths from tuberculosis among residents of North Dakota, a decrease of 37, or 30 percent, from that in 1943. At the same time, there has been a reduction of only 1 percent in the number of deaths from all causes. Here again, it is unlikely that the reduction in the number of deaths from tuberculosis was a result of a decrease in the population. Table 8 shows also that

TABLE 8.—*Percent distribution of deaths from all causes by race and sex groups: North Dakota, 1944 and 1943*

Race and sex groups	Percent distribution of deaths from all causes	
	1944	1943
Total.....	100.0	100.0
White male.....	58.5	58.6
White female.....	39.0	38.6
Nonwhite male.....	1.2	1.4
Nonwhite female.....	1.3	1.4

the differences in race-sex composition of the population as indicated by the race-sex distribution of total deaths have not been sufficiently great to account for the decrease in tuberculosis deaths.

Proportionate mortality for tuberculosis as presented in table 9 reveals that there has been a real decrease in tuberculosis mortality

TABLE 9.—*Deaths from tuberculosis (all forms) as percentages of deaths from all causes, by age, race, and sex: North Dakota, 1942-1944*

Race, sex, and year	All ages	Age			
		Under 15 years	15-44 years	45-64 years	65 years and over
White male:					
1944.....	1.4	0.8	4.8	2.0	0.6
1943.....	1.8	.3	9.1	2.1	.7
1942.....	1.8	.8	6.2	2.6	.7
White female:					
1944.....	1.4	.0	9.9	1.6	.1
1943.....	2.3	.8	10.9	1.9	.7
1942.....	2.0	1.2	11.2	1.8	.4
Nonwhite male:					
1944.....	7.9	9.1	16.7	0	5.9
1943.....	10.7	7.7	18.8	20.0	0
1942.....	22.2	0	75.0	21.7	11.1
Nonwhite female:					
1944.....	15.6	3.3	58.3	33.3	0
1943.....	19.7	4.2	68.4	0	0
1942.....	21.0	15.8	48.1	7.1	0

among females of all ages. In fact, while the total number of deaths among white females was only 1 less than the 1,995 deaths recorded in 1943, the number of tuberculosis deaths decreased from 45 to 28. There has been also a very marked decline in the proportionate mortality for white males 15-44 years. The total number of deaths in 1944 remained nearly the same as in 1943, while the number of tuberculosis deaths in this age group was reduced from 27 to 14. Among nonwhites no consistent change is noted through all the age groups. It may, therefore, be concluded from these figures that there has been in North Dakota a real decrease in tuberculosis mortality relative to mortality from all causes. The largest relative decrease occurred among males aged 15-44 years. The reduction in tuberculosis mortality for nonwhite females has been uniform through all age groups. Among males, other than those 15-44 years, and among nonwhites, tuberculosis mortality changed approximately to the same extent as did the death rate for all causes.

Although care must be exercised in the interpretation of proportionate mortality, the information furnished by these ratios is useful in the evaluation of the status and direction of change in tuberculosis mortality in the absence of detailed population statistics. It should be noted that the entire analysis of proportionate mortality is based upon death statistics without reference to population estimates. The data necessary for such an analysis are available currently in every State vital statistics office.

#### ***Tuberculosis Death Rate in 1942-44 Compared With 1939-41***

The average *de facto* death rate from tuberculosis (all forms) for the period 1942-44 was 42.3, or 7.6 percent lower than the rate of 45.8 for the period 1939-41. The last column in table 5 presents for each State a comparison of the death rates for the two periods, 1939-41, and 1942-44. It may be seen that the reduction in the death rate from tuberculosis has been widespread. The rate for 38 States was lower during the war period than in the prewar period; there were increases in the rates for 10 of the States, and the rate for one State remained the same during the two periods.<sup>7</sup> Increases in the rate were slight in a number of States but ranged to a maximum of 7.2 percent for Massachusetts. Although some of the decreases were slight, half were over 10 percent, and the maximum was nearly 25 percent (Florida).

The geographic distribution in the percentage changes in the rates between the two periods is shown in figure 7. The States for which the death rate has increased or remained practically stationary throughout the period are to be found in the northern part of the

<sup>7</sup> Some of these changes in rate are not statistically significant. In addition, many of these may be due to the effect of changes in population composition and to the fact that the size of the population in each State is an estimate rather than a census enumeration and, therefore, may contain errors of unknown magnitude.

country, and consist of all of the New England States except Vermont and New Hampshire, the industrial States of Pennsylvania, New Jersey, New York, and Michigan, and the States of Minnesota, the Dakotas, and Idaho. The areas in which the tuberculosis death rate exhibited large decreases are generally found in the South, extending from Delaware to Texas. Large decreases may also be observed for Wyoming, Utah, Arizona, and California. A comparison of the map in figure 7 with that in figure 6 indicates that the reductions have been smallest in those States where the rate is generally low and that many of the larger decreases have occurred in States with the highest rates.

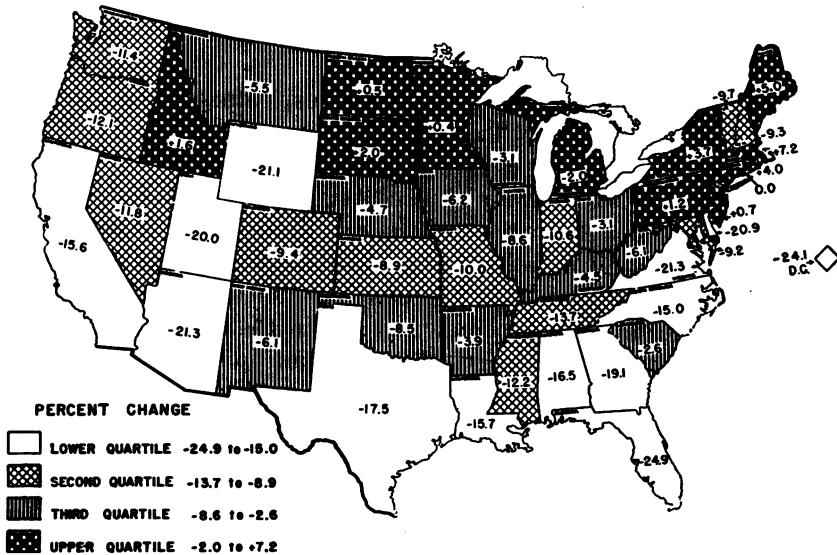


FIGURE 7.—Percent change in the death rate for tuberculosis (all forms): Each State, 1939-41 to 1942-44.

However, until careful study is made of the changes in the composition of the population that may have taken place during the war period, only tentative conclusions are justified. Nevertheless, it is encouraging that decreases of 20 percent or more have been recorded for Arizona, Florida, Virginia, Utah, Wyoming, Delaware, and for the District of Columbia.

Examination of the tuberculosis death rates for each State for 1942, 1943, and 1944 reveals that tuberculosis mortality in several States has increased steadily during the war. These States are Idaho, Maine, Nebraska, Pennsylvania, Vermont, and West Virginia.

#### *Place of Death and Place of Residence*

The ratio of the number of tuberculosis deaths by place of death to the number by place of residence of the deceased may be considered as a measure of the amount of interstate migration of tuberculosis patients. In general, the differences between the number of tuber-

culosis deaths which occurred in the State and the number of deaths to residents of the State is small for nearly all States. The few notable exceptions are Arizona, Colorado, New Mexico, and North Carolina. In Arizona in 1944, the number of deaths recorded as having occurred in that State was 27 percent higher than the number occurring among its residents. In Colorado and New Mexico there were 21 percent more deaths by place of death than by place of residence, and in North Carolina the excess was 12 percent. Maryland reported 7 percent more deaths occurring in that State than the number of deaths among its residents, but this is primarily due to the location of a tuberculosis sanatorium in that State which belongs to and serves the residents of the District of Columbia.

### **Deaths From Respiratory and Nonrespiratory Forms of Tuberculosis**

Of the 54,731 deaths from tuberculosis in 1944, 50,712, or 92.7 percent, were from tuberculosis of the respiratory system and 4,019, or 7.3 percent, were from other forms of tuberculosis. The death rate from respiratory tuberculosis was 38.3 per 100,000 population and that from nonrespiratory tuberculosis 3.0. In 1943 the corresponding rates were 39.1 and 3.4, respectively, and nonrespiratory tuberculosis constituted 8.1 percent of all tuberculosis deaths. It is, therefore, evident that mortality from nonrespiratory tuberculosis has declined more rapidly than that for tuberculosis of the respiratory system.

Deaths from nonrespiratory tuberculosis formed a larger proportion of all tuberculosis deaths among nonwhites (8.9 percent) than among whites (6.8 percent). This excess is accounted for entirely by males (9.3 percent among nonwhites as compared with 5.9 percent among whites). Among females the corresponding percentages were 8.5 and 8.3, respectively. In other words, while among whites the percentage of nonrespiratory tuberculosis is higher among females than among males, among nonwhites the percentage is slightly higher among males than among females.

The death rate from tuberculosis of the respiratory system for 1944 ranged from 9.6 per 100,000 population for residents of Utah to 113.7 for residents of Arizona (table 10). The distribution of respiratory tuberculosis death rates by State is quite similar to that of tuberculosis (all forms) presented in figure 6.

The death rate for nonrespiratory tuberculosis varied from 1.2 per 100,000 population for residents of Iowa and Kansas to 9.2 for residents of Arizona. The geographic distribution of death rates for nonrespiratory tuberculosis (fig. 8) is very similar to that for 1943.

In general there are two broad areas of relatively high death rates for tuberculosis of nonrespiratory forms. These are the States in the

Southwest and the Pacific Coast (Arizona, New Mexico, Nevada, California, and Washington) and the States of Delaware, Maryland, Virginia, Kentucky, Tennessee, Vermont, and the District of Columbia.

TABLE 10.—Number of deaths and death rates for tuberculosis of the respiratory system and of other forms by State: United States, 1944

[By place of residence]

Area	Tuber- culosis (all forms)	Tuber- culosis of respi- ratory system	Tuberculosis (other forms)		Rate per 100,000 population	
			Number	Percent	Tuber- culosis of respi- ratory system	Tuber- culosis (other forms)
United States.....	54,731	50,712	4,019	7.3	38.3	3.0
Alabama.....	1,269	1,186	83	6.5	42.1	2.9
Arizona.....	784	725	59	7.5	113.7	9.2
Arkansas.....	826	792	34	4.1	44.6	1.9
California.....	3,826	3,474	352	9.2	39.7	4.0
Colorado.....	419	389	30	7.2	33.9	2.6
Connecticut.....	661	616	45	6.8	34.7	2.5
Delaware.....	123	113	10	8.1	39.8	3.5
District of Columbia.....	547	488	59	10.8	52.3	6.3
Florida.....	823	789	34	4.1	33.3	1.4
Georgia.....	1,141	1,063	73	6.4	33.1	2.3
Idaho.....	109	94	15	13.8	17.6	2.8
Illinois.....	3,218	2,982	236	7.3	38.6	3.1
Indiana.....	1,221	1,110	111	9.1	32.5	3.2
Iowa.....	341	314	27	7.9	13.8	1.2
Kansas.....	357	336	21	5.9	18.9	1.2
Kentucky.....	1,726	1,590	136	7.9	60.5	5.2
Louisiana.....	1,158	1,087	71	6.1	42.9	2.8
Maine.....	279	257	22	7.9	32.4	2.8
Maryland.....	1,326	1,221	105	7.9	57.4	4.9
Massachusetts.....	1,698	1,616	82	4.8	38.8	2.0
Michigan.....	1,814	1,627	187	10.3	30.0	3.4
Minnesota.....	693	623	70	10.1	24.8	2.8
Mississippi.....	831	790	41	4.9	36.3	1.9
Missouri.....	1,487	1,391	96	6.5	38.8	2.7
Montana.....	175	164	11	6.3	35.3	2.4
Nebraska.....	211	190	21	10.0	15.7	1.7
Nevada.....	76	66	10	13.2	42.2	6.4
New Hampshire.....	105	96	9	8.6	21.0	2.0
New Jersey.....	1,856	1,733	123	6.6	41.6	3.0
New Mexico.....	345	313	32	9.3	58.9	6.0
New York.....	6,055	5,649	406	6.7	44.7	3.2
North Carolina.....	1,239	1,145	94	7.6	32.4	2.7
North Dakota.....	86	78	8	9.3	14.8	1.5
Ohio.....	2,787	2,566	221	7.9	37.6	3.2
Oklahoma.....	880	821	59	6.7	39.8	2.9
Oregon.....	307	266	41	13.4	21.9	3.4
Pennsylvania.....	4,020	3,765	255	6.3	40.8	2.8
Rhode Island.....	300	287	13	4.3	36.7	1.7
South Carolina.....	660	618	42	6.4	32.2	2.2
South Dakota.....	178	138	40	22.5	24.7	7.2
Tennessee.....	1,881	1,752	129	6.9	61.1	4.5
Texas.....	3,126	2,957	169	5.4	43.0	2.5
Utah.....	73	58	15	20.5	9.6	2.5
Vermont.....	124	113	11	8.9	36.3	3.5
Virginia.....	1,344	1,221	123	9.2	38.2	3.8
Washington.....	702	630	72	10.3	30.6	3.5
West Virginia.....	764	705	59	7.7	41.1	3.4
Wisconsin.....	726	674	52	7.2	22.7	1.7
Wyoming.....	34	29	5	14.7	11.3	1.9

South Dakota, surrounded by States where the rates are low, recorded the very high rate of 7.2. It is interesting to note that in 1943 South Dakota reported a similar exception with a relatively high rate while its neighboring States had low rates.

Without further detailed study it is difficult to evaluate the significance of State-to-State variation of the death rate for nonrespiratory tuberculosis. A comparison of the map (fig. 8) with the map of death rates from tuberculosis (all forms) (fig. 6) shows that although there may be some correlation between death rates for tuberculosis of the respiratory system and for other forms of tuberculosis, there are a number of striking differences. In fact, data in table 10 show that deaths from nonrespiratory tuberculosis varied from a low of 4.1 percent of all tuberculosis deaths in Arkansas and Florida to a high of 22.5 percent in South Dakota. In the midwestern States where the death rates from tuberculosis (all forms) are relatively low, deaths for nonrespiratory tuberculosis form higher percentages of the total than in the South where the rates from tuberculosis (all forms) are generally high. Among whites, the percentage which nonrespiratory formed of all tuberculosis deaths, varied from a low of 3.2 (Rhode Island) to a high of 14.8 (Utah). Among nonwhites the percentage was as high as 40.0 for the State of Nevada. (Of the 20 deaths from tuberculosis among nonwhites in Nevada, 8 were from nonrespiratory types.)

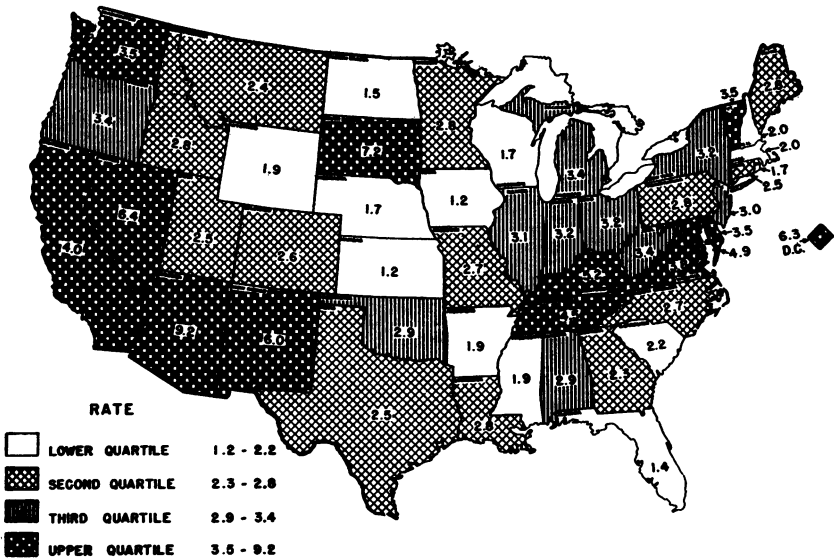


FIGURE 8.—Death rates per 100,000 population for nonrespiratory tuberculosis: Each State, 1944.

## Hospitalization for Tuberculosis as Determined From Mortality Statistics

Probably the most effective way of controlling tuberculosis in a community is to isolate the infected case, preferably in a tuberculosis institution. The extent to which this is being accomplished cannot be measured adequately by mortality statistics. Patients that died in tuberculosis sanatoria may not have been in the institution for a sufficiently long period to assure adequate protection of household and other contacts from infection, and this may be especially true of such deaths that occurred in general hospitals. However, it is safe to assume that a considerable number of tuberculosis deaths that occurred in the home constituted a serious source of infection in the community. It is, therefore, important that of the 50,712 deaths from respiratory tuberculosis in 1944, 18,242 or 36 percent did not occur in an institution. In addition there were 12,606 deaths, or 24.8 percent, which occurred in general hospitals where the length of stay is generally short. Taken together these two groups account for slightly more than 60 percent of all deaths from tuberculosis of the respiratory system. However, some progress is being made in the direction of increased hospitalization. It may be seen from table 11

TABLE 11.—Number and percent of deaths from respiratory tuberculosis in institutions, by type of service and type of control: United States, 1939-41 average, 1943, and 1944

Type of service and type of control	Number			Percent		
	1944	1943	1939-41 average	1944	1943	1939-41 average
Total.....	50,712	52,407	55,444	100.0	100.0	100.0
Deaths not in institutions.....	18,242	19,866	24,519	36.0	37.9	44.2
Deaths in institutions.....	32,470	32,541	30,925	64.0	62.1	55.8
Type of service:						
General hospital.....	12,606	12,544	12,450	24.8	23.9	22.5
Tuberculosis hospital.....	14,496	14,568	13,041	28.6	27.8	23.5
Nervous and mental institutions.....	4,056	4,098	3,528	8.0	7.8	5.4
Other institutions.....	1,312	1,331	1,906	2.6	2.5	3.4
Type of control:						
Federal.....	3,426	2,950	2,541	6.8	5.6	4.6
State.....	7,969	3,138	21,871	{	15.7	15.5
County and city.....	15,157	15,473			29.9	29.5
Nonprofit.....	4,806	4,759			9.5	9.1
Proprietary and unknown.....	1,112	1,221	1,786	2.2	2.3	3.2

that even during the war period there has been a reduction in the number and percentage of deaths which occurred in the home. For example, there were 4,653 fewer deaths from respiratory tuberculosis occurring in the home in 1943 than in the annual 3-year average for the period 1939-41. In 1944 there has been a further reduction of 1,624 from the 1943 figure. These numbers account for almost the entire reduction in the number of deaths from respiratory tuberculosis in the 2 years.

Compared with the average figure for the period 1939-41, there is a noticeable increase in deaths that occurred in tuberculosis hospitals and in nervous and mental hospitals where the stay is normally longer than in general hospitals. In 1944, there were 14,496 deaths in tuberculosis hospitals compared with the average annual number of 13,041 for the period 1939-41. In 1944, 28.6 percent of all deaths from respiratory tuberculosis and 44.6 percent of all such deaths in institutions occurred in tuberculosis hospitals. The corresponding percentages for 1939-41 were 23.5 and 42.2, respectively.

The number of deaths from respiratory tuberculosis in nervous and mental institutions in 1944 was 4,056, amounting to 8.0 percent of all deaths from respiratory tuberculosis and 12.5 percent of all institutional deaths from respiratory tuberculosis. The annual average number for 1939-41 was 3,528, amounting to 6.4 percent of all respiratory tuberculosis deaths and 11.4 percent of all institutional deaths.

Nearly one-half of the deaths from respiratory tuberculosis in institutions in 1944 occurred in county-city institutions, and nearly one-quarter occurred in State institutions. Less than one-fifth of all institutional deaths from tuberculosis occurred in institutions which were not under government ownership or control.

Analysis of the hospitalization patterns for respiratory tuberculosis by race and sex reveals a number of interesting points which should prove of value to administrators of tuberculosis control programs. In the first place, it is surprising to find that the percentage of deaths occurring outside of an institution is as great among the whites as among nonwhites (table 12). On the other hand, a considerably

TABLE 12.—*Percent of deaths from respiratory tuberculosis in institutions by type of service, by race and sex: United States, 1943 and 1944*

Race and sex	Type of service								Percent of deaths not in institutions	
	General		Tuberculosis		Nervous and mental		Other			
	1943	1944	1943	1944	1943	1944	1943	1944	1943	1944
All races, both sexes.....	23.9	24.8	27.8	28.6	7.8	8.0	2.5	2.6	37.9	36.0
Male.....	27.7	28.5	28.9	29.6	7.4	7.7	2.9	2.9	33.1	31.3
Female.....	17.9	19.0	26.0	26.9	8.5	8.6	2.0	2.1	45.6	43.4
White male.....	27.1	27.3	29.2	29.8	8.1	8.5	2.8	2.9	32.7	31.4
White female.....	16.7	17.2	25.6	26.5	10.0	9.9	2.3	2.3	45.5	44.0
Nonwhite male.....	29.5	32.2	28.0	29.0	5.1	4.8	3.0	2.8	34.4	31.2
Nonwhite female.....	20.5	22.7	26.8	27.8	5.4	5.6	1.5	1.5	45.8	42.4

greater proportion of the females died at home (43.4 percent) than was the case among males (31.3 percent). This sex difference may be observed in both racial groups. Thus among whites, 31.4 percent of male deaths and 44.0 percent of female deaths did not occur in an institution. The corresponding percentages among nonwhites were 31.2 and 42.4, respectively. In view of the fact that females are



generally in much closer contact with members of the household, particularly children, it is of considerable significance that such a larger proportion of them died at home.

A further review of the tabulations shows that the main difference between the sexes is accounted for by deaths in general hospitals, where 28.5 percent of all deaths from respiratory tuberculosis among males occurred and only 19.0 percent of the female deaths. This sex difference is present in each of the racial groups.

Also of interest is the fact that although the percentages of deaths that occurred in all institutions were nearly the same for the two racial groups, some differences appear between whites and nonwhites when the data are analyzed by type of institution where death occurred. A larger proportion of the nonwhite deaths occurred in general hospitals than is the case among whites. On the other hand, a larger percentage of deaths occurred in nervous and mental institutions among whites than among nonwhites.

#### *Institutional Deaths From Respiratory Tuberculosis By States*

There was a large State-to-State variation in the proportion of deaths from respiratory tuberculosis that occurred in institutions. These proportions vary to a large extent, according to the availability of institutional facilities of different kinds in various States. The lowest percentage in 1944 was for the residents of Mississippi (22.5 percent) and the highest was recorded for residents of Minnesota (88.8 percent). (For residents of the District of Columbia the percentage was 89.8). The proportion of deaths that occurred in tuberculosis hospitals varied from a low of 5.3 percent in Idaho to a high of 51.3 in North Dakota, while the percentage of deaths in general hospitals varied from 7.0 in Mississippi to 57.6 in Nevada. (The percentage was 58.0 in the District of Columbia). Only 1.1 percent of all deaths from respiratory tuberculosis among residents of Arizona occurred in mental hospitals compared with 18.5 percent for those of Minnesota (table 13).

It may be of interest to indicate the States in which there have been large increases in the percentage of deaths from respiratory tuberculosis which occurred in the home between 1943 and 1944. These States are Delaware (an increase of 19.5 percent), Iowa (27.7 percent), Montana (35.4), New Hampshire (45.3), Oregon (39.9), and Utah (56.8 percent). On the other hand, a number of States showed relatively large decreases in the percentage of deaths occurring at home. These were: Idaho (a decrease of 23.7 percent), Nebraska (24.4), New Mexico (22.2), North Dakota (38.6), and Rhode Island (22.5 percent).

The percentage of deaths that occurred outside of institutions may be considered a rough index of the lack of facilities for the institutional care of tuberculosis cases. It may be seen from figure 9 that the greatest need for facilities exists in the South. More than one-half of all

respiratory tuberculosis deaths in nearly every Southern State did not occur in an institution. The most favorable hospitalization picture

TABLE 13.—Number of deaths from respiratory tuberculosis in institutions by type of service and type of control, by State: United States, 1944

[By place of residence]

Area	Total	Deaths not in institutions	Deaths in institutions	Type of service				Type of control				
				General hospital	Tuberculosis hospital	Nervous and mental hospital	Other institutions	Federal	State	County and city	Nonprofit	Proprietary and unknown
United States.....	50,712	18,241	32,471	12,607	14,496	4,056	1,312	3,428	7,968	15,158	4,805	1,112
Alabama.....	1,186	862	324	92	152	60	20	59	60	111	74	20
Arizona.....	725	287	438	281	125	8	24	207	15	130	57	29
Arkansas.....	792	483	309	66	179	61	3	50	227	10	12	10
California.....	3,474	674	2,800	1,637	872	177	114	315	172	1,876	229	208
Colorado.....	389	112	277	170	75	21	11	42	18	57	136	24
Connecticut.....	616	119	497	112	305	68	12	19	351	38	87	2
Delaware.....	113	45	68	9	56	2	1	2	56	0	9	1
District of Columbia.....	488	50	438	283	130	18	7	105	1	317	15	0
Florida.....	789	307	482	212	182	47	41	53	86	280	42	21
Georgia.....	1,068	680	388	107	156	100	25	58	138	128	44	20
Idaho.....	94	29	65	44	5	5	11	17	5	11	21	11
Illinois.....	2,982	633	2,349	1,053	937	319	40	200	312	1,465	308	64
Indiana.....	1,110	534	576	197	292	68	19	57	145	305	55	14
Iowa.....	314	107	207	69	91	41	6	16	110	51	27	3
Kansas.....	336	126	210	85	80	29	6	32	108	25	44	1
Kentucky.....	1,590	1,156	434	133	211	75	15	71	79	199	55	30
Louisiana.....	1,087	532	555	387	96	63	9	76	395	17	57	10
Maine.....	257	74	183	36	104	38	5	14	139	2	24	4
Maryland.....	1,221	340	881	350	441	64	26	68	419	257	133	4
Massachusetts.....	1,616	267	1,349	369	735	194	51	115	313	775	133	13
Michigan.....	1,627	239	1,388	419	771	103	95	78	222	719	281	88
Minnesota.....	623	70	553	166	267	115	5	61	159	294	32	7
Mississippi.....	790	612	178	55	58	39	26	30	76	25	36	11
Missouri.....	1,391	517	874	379	319	67	109	93	196	466	100	19
Montana.....	164	67	97	46	45	4	2	18	45	5	20	9
Nebraska.....	190	44	146	87	31	26	2	17	62	43	21	3
Nevada.....	66	18	48	38	6	0	4	8	0	32	3	5
New Hampshire.....	96	40	56	9	35	11	1	1	23	3	6	23
New Jersey.....	1,733	319	1,414	323	853	215	23	61	163	1,005	167	18
New Mexico.....	313	110	203	130	67	4	2	110	34	0	54	5
New York.....	5,649	872	4,777	1,919	2,064	625	169	357	732	2,681	975	32
North Carolina.....	1,145	511	634	93	427	85	29	100	297	162	58	17
North Dakota.....	78	17	61	14	40	6	1	6	46	3	5	1
Ohio.....	2,566	844	1,722	677	761	232	52	115	245	1,093	183	86
Oklahoma.....	821	430	391	113	181	73	24	85	220	11	28	47
Oregon.....	266	68	198	51	109	29	9	28	80	43	28	19
Pennsylvania.....	3,765	1,203	2,562	1,127	906	404	125	154	827	916	643	22
Rhode Island.....	287	61	226	33	122	19	52	16	137	52	20	1
South Carolina.....	618	243	375	64	277	34	0	23	223	95	34	0
South Dakota.....	138	43	95	30	46	18	1	41	41	1	11	1
Tennessee.....	1,752	1,213	539	155	279	77	28	51	77	242	151	18
Texas.....	2,957	1,944	1,013	349	481	149	34	136	247	417	136	77
Utah.....	58	20	38	20	13	2	3	10	13	8	3	4
Vermont.....	113	48	65	15	44	6	0	3	44	2	16	0
Virginia.....	1,221	672	549	158	307	66	18	71	218	170	66	24
Washington.....	630	114	516	202	219	63	32	101	64	236	59	56
West Virginia.....	705	346	359	75	209	65	10	19	269	6	40	25
Wisconsin.....	674	131	543	148	326	60	9	52	50	371	65	5
Wyoming.....	29	8	21	10	9	1	1	7	9	3	2	0

is presented by the States in the Great Lakes region, as well as by New York, Massachusetts, Connecticut, New Jersey, California, Washington, and the District of Columbia. In these States less than one-fifth of all deaths from respiratory tuberculosis occurred at home.

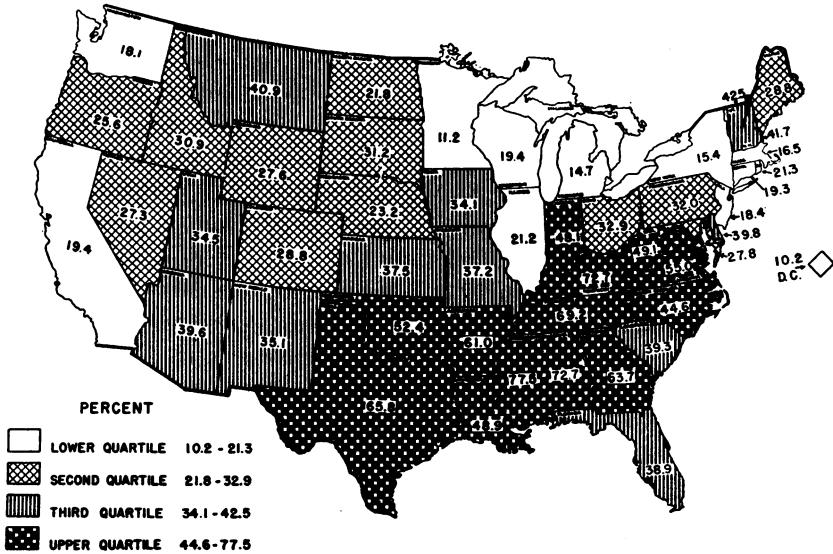


FIGURE 9.—Percent of deaths from respiratory tuberculosis occurring outside of hospitals and institutions; Each State, 1944.

## Summary

This paper presents an analysis of data for 1944 on tuberculosis mortality in the United States and in each State, and a comparison of the death rates from tuberculosis for the 3 war years, 1942-44, and for the prewar period 1939-41.

The number of deaths from tuberculosis (all forms) in 1944 was 54,731, the death rate being 41.3 per 100,000 population. The rates for white females and for nonwhites of both sexes continued to decline while that for white males showed little change.

Death rates for tuberculosis (all forms) were highest for nonwhite males and lowest for white females. They were higher in the older age groups than in the younger. Among children and young adults, the rates were higher for females than for males. In the older age groups, the rates were much higher for males.

Death rates for tuberculosis (all forms) were lower in 1942-44 than in 1939-41 in all age groups with the exception of males aged 65 years and over where there has been an increase in the rate.

There were 4,370 deaths from tuberculosis (all forms) among veterans of all wars. Of these 981 were among World War II veterans

and 3,009 among veterans of World War I. The percentage of deaths occurring in institutions was much greater among veterans (86.1 percent) than among the general population (64.0 percent). It was slightly higher among veterans of World War II (89.3 percent) than among World War I veterans (84.8 percent).

The tuberculosis death rate for individual States ranged from a low of 12.0 for Utah to a high of 122.9 for Arizona. The reduction in rate from 1943 was widespread and occurred in 32 of the States. However, in 16 States there was an increase in the rate. The largest increase was reported for residents of Arizona (25.2 percent) and the largest decrease for residents of North Dakota (28.2 percent).

The death rate for the period 1942-44 was 42.3, or 7.6 percent lower than the rate of 45.8 for the period 1939-41. Reductions occurred in 38 States and increases in 10. The highest increase was for Massachusetts (7.2 percent), and the greatest reduction occurred in Florida (24.9 percent). The smallest reductions occurred in the New England and Middle Atlantic States. There were 10 States in which the number of tuberculosis deaths in 1944 was greater than the average annual number for the period 1939-41.

Nearly 93 percent of the tuberculosis deaths in 1944 were of the respiratory system. The proportion of nonrespiratory tuberculosis varied from 4.1 percent for residents of Arkansas and Florida to 22.5 percent for residents of South Dakota.

Of the 50,712 deaths from respiratory tuberculosis in 1944, 32,470, or 64 percent, occurred in institutions; 12,606 deaths, or 24.8 percent, in general hospitals; 14,496, or 28.6 percent, in tuberculosis hospitals; 4,056, or 8.0 percent, in nervous and mental institutions; and 1,312, or 2.6 percent, in other institutions. There were 18,242 deaths, or 36.0 percent, occurring in the home. The percentage of tuberculosis deaths in institutions was as great among nonwhites as among whites. A considerably greater proportion of deaths among females occurred in the home (43.4 percent) than was the case among males (31.3 percent).

The percentage of respiratory tuberculosis deaths occurring in institutions varied from 22.5 percent for residents of Mississippi to 88.2 percent for residents of Minnesota. The range in the proportion of deaths in institutions by type of service was also very large.

Because of the large changes in the population and its composition, the evaluation of the tuberculosis mortality problem during the war is difficult. This is particularly true of data for individual States. However, for the country as a whole, reference is also made wherever possible, to *de jure* death rates for tuberculosis, which are more comparable to the rates for the pre-war years, because of the inclusion of data for the armed forces overseas.

## INCIDENCE OF HOSPITALIZATION, FEBRUARY 1946

Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service. The data cover hospital service plans scattered throughout the country mostly in large cities.

Item	February	
	1945	1946
1. Number of plans supplying data.....	75	79
2. Number of persons eligible for hospital care.....	15,906,124	18,312,327
3. Number of persons admitted for hospital care.....	123,026	149,002
4. Incidence per 1,000 <sup>1</sup> persons, annual rate during current month (daily rate × 365).....	100.8	106.1
5. Incidence per 1,000 persons, annual rate for the 12 months ended Feb. 28, 1946.....	103.0	107.5
6. Number of plans reporting on hospital days.....	21	29
7. Days of hospital care per case discharged during month <sup>2</sup> .....	8.57	9.09

<sup>1</sup> Correction: Reports for October, November, and December 1945 and for January 1946, which appeared in the Dec. 14, 1945, Jan. 18, Feb. 8, and Mar. 15, 1946, issue, of PUBLIC HEALTH, REPORTS, respectively, listed this figure as 100, instead of 1,000.

<sup>2</sup> Days include entire stay of patient in hospital whether at full pay or at a discount.

## DEATHS DURING WEEK ENDED MAR. 9, 1946

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar. 9, 1946	Correspond- ing week, 1945
<b>Data for 92 large cities of the United States:</b>		
Total deaths.....	9,855	9,549
Average for 3 prior years.....	9,740	-----
Total deaths, first 10 weeks of year.....	103,879	97,466
Deaths under 1 year of age.....	600	606
Average for 3 prior years.....	645	-----
Deaths under 1 year of age, first 10 weeks of year.....	6,058	6,327
<b>Data from industrial insurance companies:</b>		
Policies in force.....	67,180,530	67,107,271
Number of death claims.....	14,660	15,343
Death claims per 1,000 policies in force, annual rate.....	11.4	11.9
Death claims per 1,000 policies, first 10 weeks of year, annual rate.....	11.3	10.8

# PREVALENCE OF DISEASE

*No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring*

## UNITED STATES

### REPORTS FROM STATES FOR WEEK ENDED MARCH 16, 1946

#### Summary

The incidence of diphtheria continues above that for corresponding weeks of recent years. The total of 345 cases for the current week (as compared with 325 last week and a 5-year, 1941-45, median of 281) is more than reported for the corresponding week of any of the past 6 years. Increases over last week's figures are reported in the New England, North Central, and Mountain areas. An aggregate of 174 cases occurred in the 7 States reporting 15 or more cases each, all of which reported increases except Pennsylvania and Texas. These States (last week's figures in parentheses) are as follows: Pennsylvania 16 (21), Texas 41 (48), Ohio 28 (20), Illinois 34 (18), Virginia 16 (7), North Carolina 15 (11), California 24 (18). The total cases reported to date, 4,243, is a larger number than reported for the corresponding period of any other year since 1940. The 5-year median for the period is 3,238.

A total of 4,054 cases of influenza was reported, as compared with 5,532 last week and a 5-year median of 4,508. Of the current total, an aggregate of 3,030 cases was reported in 4 States—Virginia, South Carolina, Louisiana, and Texas, of which only Louisiana reported an increase. The total to date is 169,936, as compared with 314,418 for the corresponding period in 1944 and a 5-year median of 54,065.

Of the total of 186 cases of meningococcus meningitis, as compared with 202 last week and 243 for the 5-year median, 82 occurred in 6 States—New York 19, California 14, Texas 13, and Illinois, Michigan, and Virginia, 12 each. The total to date is 2,233, as compared with 2,791 for the period last year, which latter number is the 5-year median for the period.

The total of 23 cases of poliomyelitis (as compared with 37 last week and 20 for the 5-year median) is the lowest weekly total reported so far this year. The lowest weekly total last year, 25 cases, was reported for the corresponding week of that year. California, with a report of 4 cases, is the only State reporting more than 2 cases for the week. The cumulative total, 466 cases, is more than reported for the corresponding period of any other year since 1928.

Deaths recorded for the week in 93 large cities of the United States totaled 9,267, as compared with 9,885 last week, 9,622 and 9,532, respectively, for the corresponding weeks of 1945 and 1944, and a 3-year (1943-45) average of 9,704. The cumulative total is 113,546, as compared with 107,463 for the corresponding period last year.

*Telegraphic morbidity reports from State health officers for the week ended Mar. 16, 1946, and comparison with corresponding week of 1945 and 5-year median*

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1941-45	Week ended—		Median 1941-45	Week ended—		Median 1941-45	Week ended—		Median 1941-45
	Mar. 16, 1946	Mar. 17, 1945		Mar. 16, 1946	Mar. 17, 1945		Mar. 16, 1946	Mar. 17, 1945		Mar. 16, 1946	Mar. 17, 1945	
<b>NEW ENGLAND</b>												
Maine.....	3	2	1	3	-----	-----	61	4	94	1	1	2
New Hampshire.....	0	0	0	-----	-----	-----	11	-----	10	1	0	0
Vermont.....	0	0	0	9	1	-----	13	15	18	0	0	0
Massachusetts.....	9	7	5	-----	-----	-----	613	144	811	2	3	3
Rhode Island.....	0	0	0	1	-----	-----	9	10	14	2	1	1
Connecticut.....	0	1	1	3	2	3	164	122	407	5	2	3
<b>MIDDLE ATLANTIC</b>												
New York.....	9	22	21	14	14	18	3,437	136	2,321	19	36	36
New Jersey.....	4	3	3	7	6	15	2,090	75	1,366	4	7	7
Pennsylvania.....	16	7	10	5	2	2	3,035	163	1,258	8	16	16
<b>EAST NORTH CENTRAL</b>												
Ohio.....	28	14	6	16	27	22	412	68	732	8	13	6
Indiana.....	6	7	7	14	6	9	993	47	266	3	1	1
Illinois.....	34	2	8	22	3	41	1,925	92	963	12	22	18
Michigan <sup>1</sup> .....	13	7	7	7	2	6	3,318	70	555	12	4	4
Wisconsin.....	11	1	1	46	33	40	1,046	33	871	4	3	3
<b>WEST NORTH CENTRAL</b>												
Minnesota.....	10	5	3	3	2	2	49	9	94	4	3	3
Iowa.....	5	3	3	-----	-----	4	242	16	213	2	0	0
Missouri.....	7	22	6	1	4	4	516	9	325	2	7	7
North Dakota.....	0	2	2	4	1	1	20	4	64	0	2	1
South Dakota.....	0	0	0	-----	-----	-----	29	23	27	0	3	0
Nebraska.....	4	1	2	24	-----	11	256	22	70	0	0	0
Kansas.....	9	2	3	5	2	6	931	16	513	1	1	1
<b>SOUTH ATLANTIC</b>												
Delaware.....	0	1	1	-----	-----	-----	24	17	17	0	1	0
Maryland <sup>1</sup> .....	10	6	6	12	3	5	373	52	170	8	9	9
District of Columbia.....	0	0	0	-----	-----	-----	179	10	100	5	1	1
Virginia.....	16	3	7	300	551	551	463	89	779	12	8	8
West Virginia.....	3	5	3	4	13	68	61	66	148	3	5	3
North Carolina.....	15	6	7	-----	-----	-----	28	389	27	921	6	6
South Carolina.....	4	4	5	376	411	505	316	62	257	1	0	1
Georgia.....	6	5	4	7	17	119	117	29	303	4	2	2
Florida.....	4	1	3	3	1	10	92	60	185	1	7	7
<b>EAST SOUTH CENTRAL</b>												
Kentucky.....	4	9	5	52	-----	6	583	23	91	2	4	4
Tennessee.....	9	2	5	60	45	81	301	108	312	4	10	8
Alabama.....	3	6	6	168	144	252	216	9	349	5	4	4
Mississippi <sup>1</sup> .....	5	8	8	-----	-----	-----	-----	-----	-----	5	3	3
<b>WEST SOUTH CENTRAL</b>												
Arkansas.....	5	2	7	109	88	127	196	65	235	1	3	3
Louisiana.....	7	5	5	405	31	13	337	11	68	6	5	5
Oklahoma.....	3	2	7	88	327	207	156	39	65	1	2	2
Texas.....	41	33	34	1,949	1,200	1,228	1,310	443	1,416	13	12	12
<b>MOUNTAIN</b>												
Montana.....	1	3	3	26	27	24	23	17	87	1	0	0
Idaho.....	0	3	1	20	-----	-----	69	2	72	0	0	0
Wyoming.....	0	2	1	2	6	6	42	13	95	0	1	0
Colorado.....	6	5	7	39	29	44	445	18	247	0	0	0
New Mexico.....	0	1	1	1	1	4	7	2	66	1	1	0
Arizona.....	6	1	1	184	67	105	75	4	136	0	0	1
Utah <sup>1</sup> .....	0	1	0	7	-----	8	635	104	104	0	1	1
Nevada.....	0	0	0	-----	-----	3	25	-----	4	0	0	0
<b>PACIFIC</b>												
Washington.....	5	9	2	-----	-----	1	1,049	210	210	2	6	6
Oregon.....	0	19	4	17	11	25	288	42	167	1	0	2
California.....	24	29	21	51	30	74	2,871	1,187	1,187	14	27	27
<b>Total.....</b>	<b>345</b>	<b>281</b>	<b>281</b>	<b>4,054</b>	<b>3,097</b>	<b>4,508</b>	<b>29,812</b>	<b>3,787</b>	<b>23,150</b>	<b>186</b>	<b>243</b>	<b>243</b>
<b>11 weeks.....</b>	<b>4,243</b>	<b>3,441</b>	<b>3,238</b>	<b>169,936</b>	<b>46,295</b>	<b>54,065</b>	<b>152,241</b>	<b>23,960</b>	<b>150,593</b>	<b>2,233</b>	<b>2,791</b>	<b>2,791</b>

<sup>1</sup> New York City only.

<sup>2</sup> Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended Mar. 16, 1946, and comparison with corresponding week of 1945 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever <sup>1</sup>		
	Week ended—		Median 1941-45	Week ended—		Median 1941-45	Week ended—		Median 1941-45	Week ended—		Median 1941-45
	Mar. 16, 1946	Mar. 17, 1945		Mar. 16, 1946	Mar. 17, 1945		Mar. 16, 1946	Mar. 17, 1945		Mar. 16, 1946	Mar. 17, 1945	
<b>NEW ENGLAND</b>												
Maine.....	0	0	0	36	40	20	0	0	0	0	0	0
New Hampshire.....	0	0	0	11	12	6	0	0	0	0	0	0
Vermont.....	1	0	0	4	24	11	0	0	0	1	0	0
Massachusetts.....	0	1	0	230	403	403	0	0	0	1	5	1
Rhode Island.....	0	0	0	9	35	14	0	0	0	0	0	0
Connecticut.....	2	0	0	68	101	69	0	0	0	2	0	0
<b>MIDDLE ATLANTIC</b>												
New York.....	1	6	0	680	894	623	0	0	0	1	3	5
New Jersey.....	0	1	0	117	182	197	0	0	0	0	1	0
Pennsylvania.....	2	0	0	447	748	572	0	0	0	1	4	6
<b>EAST NORTH CENTRAL</b>												
Ohio.....	1	0	0	430	474	374	0	0	0	2	3	2
Indiana.....	0	0	0	82	208	191	1	5	1	1	1	1
Illinois.....	0	0	1	211	409	409	0	0	2	3	3	1
Michigan <sup>2</sup> .....	2	0	0	168	305	259	0	0	0	2	0	1
Wisconsin.....	0	2	1	160	245	245	0	3	1	0	0	0
<b>WEST NORTH CENTRAL</b>												
Minnesota.....	0	0	0	64	93	93	0	0	0	0	0	0
Iowa.....	0	0	0	64	64	65	0	0	0	0	0	0
Missouri.....	1	0	1	44	134	134	1	3	3	0	2	2
North Dakota.....	0	0	0	16	42	32	0	1	0	0	0	0
South Dakota.....	0	0	0	21	16	16	0	0	0	0	0	0
Nebraska.....	0	0	0	49	93	50	0	0	0	0	0	0
Kansas.....	0	0	0	109	106	106	1	0	1	0	1	0
<b>SOUTH ATLANTIC</b>												
Delaware.....	0	0	0	6	18	16	0	0	0	0	0	0
Maryland <sup>2</sup> .....	0	0	0	106	245	112	0	0	0	1	0	0
District of Columbia.....	0	0	0	30	63	32	0	0	0	1	0	0
Virginia.....	2	0	0	141	156	53	0	0	0	1	1	2
West Virginia.....	0	0	0	38	73	46	0	0	0	1	1	2
North Carolina.....	0	3	0	54	94	41	1	0	0	1	0	0
South Carolina.....	0	0	0	8	14	8	0	0	0	1	3	1
Georgia.....	0	1	0	10	26	17	0	1	0	3	1	3
Florida.....	2	0	0	4	7	8	0	0	0	1	5	4
<b>EAST SOUTH CENTRAL</b>												
Kentucky.....	0	0	0	33	55	77	0	0	0	0	2	2
Tennessee.....	0	0	0	50	61	75	0	1	1	0	2	2
Alabama.....	0	0	0	52	22	22	0	0	1	2	1	1
Mississippi <sup>2</sup> .....	1	2	0	7	32	7	5	3	0	2	1	1
<b>WEST SOUTH CENTRAL</b>												
Arkansas.....	0	1	0	15	77	7	0	0	0	4	2	2
Louisiana.....	1	0	0	18	15	14	0	2	0	3	1	1
Oklahoma.....	0	0	0	17	47	21	0	1	0	0	0	1
Texas.....	0	1	1	71	130	74	4	0	2	7	1	6
<b>MOUNTAIN</b>												
Montana.....	2	0	0	11	28	28	0	0	0	0	3	0
Idaho.....	0	0	0	4	43	12	0	0	0	0	1	0
Wyoming.....	0	0	0	8	14	14	0	0	0	0	0	0
Colorado.....	0	0	0	23	71	71	0	0	1	4	0	0
New Mexico.....	0	0	0	14	26	5	0	0	0	0	2	0
Arizona.....	0	0	0	15	36	16	0	0	0	2	0	1
Utah <sup>2</sup> .....	0	0	0	12	41	41	0	0	0	0	1	0
Nevada.....	0	0	0	0	1	1	0	0	0	0	0	0
<b>PACIFIC</b>												
Washington.....	0	2	0	36	153	46	0	0	0	1	1	1
Oregon.....	1	0	0	16	62	11	0	0	0	0	0	0
California.....	4	4	2	205	422	170	0	0	0	3	4	5
Total.....	23	24	20	4,024	6,660	4,426	13	20	36	52	56	67
11 weeks.....	466	397	287	36,525	61,470	44,084	85	114	247	475	624	816

<sup>1</sup> Period ended earlier than Saturday.

<sup>2</sup> Including paratyphoid fever reported separately, as follows: Vermont 1; Massachusetts 1; Connecticut 2; New York 1; Ohio 1; Georgia 3; Louisiana 1; Texas 1; Colorado 1.



Telegraphic morbidity reports from State health officers for the week ended Mar. 16, 1946, and comparison with corresponding week of 1945 and 5-year median—Con.

Division and State	Whooping cough			Week ended Mar. 16, 1946							
	Week ended—		Median 1941- 45	Dysentery			En- ceph- alitis, infectious	Rocky Mt. spot- ted fever	Tula- remia	Ty- phus fever, en- demic	Un- du- lant fever
	Mar. 16, 1946	Mar. 17, 1945		Ame- bic	Bacil- lary	Un- spec- ified					
<b>NEW ENGLAND</b>											
Maine.....	26	82	36								1
New Hampshire.....			7								
Vermont.....	18	47	23								2
Massachusetts.....	169	214	214		4		1				5
Rhode Island.....	30	37	34								
Connecticut.....	73	80	66	2							4
<b>MIDDLE ATLANTIC</b>											
New York.....	152	270	318	6	4						3
New Jersey.....	178	121	128				1				1
Pennsylvania.....	72	205	220								4
<b>EAST NORTH CENTRAL</b>											
Ohio.....	65	212	212								3
Indiana.....	22	16	25								
Illinois.....	88	70	83	1	1						5
Michigan <sup>2</sup> .....	97	63	147	1	3		1				2
Wisconsin.....	55	63	97	1							7
<b>WEST NORTH CENTRAL</b>											
Minnesota.....	10	20	26	1							3
Iowa.....	8	3	18								
Missouri.....	3	16	16								
North Dakota.....		1	2								
South Dakota.....	3		1								
Nebraska.....	3	10	10								
Kansas.....	20	37	42				1		3		20
<b>SOUTH ATLANTIC</b>											
Delaware.....	4		1								
Maryland <sup>2</sup> .....	23	42	59			1	1				2
District of Columbia.....	2	2	9							1	
Virginia.....	15	30	55			68					2
West Virginia.....	14	41	45	1							
North Carolina.....	64	132	132	1			1				
South Carolina.....	19	76	61		6						
Georgia.....	12	4	32	1	1				5	6	2
Florida.....	10	27	27							3	
<b>EAST SOUTH CENTRAL</b>											
Kentucky.....	38	37	61								
Tennessee.....	13	15	33				1		1		
Alabama.....	15	21	35							4	1
Mississippi <sup>2</sup> .....									1		4
<b>WEST SOUTH CENTRAL</b>											
Arkansas.....	1	23	11	1					1		1
Louisiana.....	5	2	2						2	2	1
Oklahoma.....	14	28	21								1
Texas.....	167	230	230	3	253	30	1		1	9	7
<b>MOUNTAIN</b>											
Montana.....	1	12	12								
Idaho.....	5	3	3								
Wyoming.....		2	2								
Colorado.....	3	27	29								1
New Mexico.....	9	6	9		1						
Arizona.....	34	20	23			14					2
Utah <sup>2</sup> .....	9	17	40								1
Nevada.....											
<b>PACIFIC</b>											
Washington.....	32	20	55								
Oregon.....	14	23	23								
California.....	93	295	295	3	2					3	5
<b>Total.....</b>	<b>1,708</b>	<b>2,709</b>	<b>3,531</b>	<b>22</b>	<b>275</b>	<b>113</b>	<b>9</b>	<b>0</b>	<b>14</b>	<b>33</b>	<b>86</b>
Same week, 1945.....	2,709			27	356	51	7	0	10	28	69
Average, 1945-45.....	2,947			28	219	64	11	0	13	434	
11 weeks: 1946.....	19,980			422	3,195	1,212	94	4	227	533	725
1945.....	26,139			297	5,710	1,430	73	4	218	575	923
Average, 1945-45.....	29,798		42,972	288	3,387	867	101	4	174	478	

<sup>2</sup> Period ended earlier than Saturday.

<sup>4</sup> 5-year median, 1941-45.

Leptosy: Florida 1 case.

**WEEKLY REPORTS FROM CITIES**

*City reports for week ended Mar. 9, 1946*

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Pollomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
<b>NEW ENGLAND</b>												
Maine:												
Portland	0	0	0	0	0	4	0	5	0	0	0	5
New Hampshire:												
Concord	0	0	0	0	0	1	0	0	0	0	0	0
Vermont:												
Barre	0	0	0	0	0	0	0	0	0	0	0	0
Massachusetts:												
Boston	3	0	1	1	106	4	14	0	54	0	1	22
Fall River	0	0	0	0	3	0	0	0	6	0	0	1
Springfield	0	0	0	0	7	0	0	0	7	0	0	1
Worcester	0	0	0	0	29	0	12	0	10	0	0	22
Rhode Island:												
Providence	0	0	1	0	6	1	5	0	6	0	0	42
Connecticut:												
Bridgeport	0	0	1	1	1	0	1	0	2	0	0	4
Hartford	0	0	0	0	2	0	1	0	0	0	0	13
New Haven	0	0	0	0	86	0	1	0	2	0	0	3
<b>MIDDLE ATLANTIC</b>												
New York:												
Buffalo	2	0	2	2	151	2	3	0	14	0	0	22
New York	16	1	2	1	1,155	9	71	0	365	0	1	49
Rochester	0	0	0	0	265	0	2	0	6	0	0	0
Syracuse	0	0	0	0	298	0	0	0	8	0	0	3
New Jersey:												
Camden	1	0	0	0	70	2	2	0	3	0	0	1
Newark	0	0	1	1	714	1	6	0	8	0	1	32
Trenton	0	0	1	0	1	0	3	0	6	0	0	1
Pennsylvania:												
Philadelphia	5	0	4	2	920	4	18	0	70	0	1	24
Pittsburgh	0	0	1	1	5	4	5	1	19	0	0	5
Reading	0	0	2	2	414	0	3	0	3	0	0	10
<b>EAST NORTH CENTRAL</b>												
Ohio:												
Cincinnati	0	0	2	2	124	1	2	0	5	0	0	0
Cleveland	1	0	4	1	15	2	9	0	33	0	0	15
Columbus	9	0	1	1	4	0	2	0	9	0	0	5
Indiana:												
Fort Wayne	0	0	0	0	0	0	0	0	7	0	0	0
Indianapolis	0	0	0	0	509	0	4	0	15	0	0	4
South Bend	0	0	0	0	1	0	0	0	5	0	0	1
Terre Haute	0	0	0	0	0	0	0	0	1	0	0	0
Illinois:												
Chicago	0	0	2	1	1,074	11	28	0	80	0	0	54
Springfield	0	0	0	0	0	0	2	0	4	0	0	5
Michigan:												
Detroit	6	0	0	0	1,816	2	15	0	37	0	0	33
Flint	0	0	0	0	19	0	4	0	3	0	0	0
Wisconsin:												
Kenosha	0	0	0	0	0	1	0	0	2	0	0	0
Milwaukee	0	0	0	0	427	0	2	0	25	0	0	34
Racine	0	0	0	0	3	0	0	0	3	0	0	3
Superior	0	0	0	0	1	0	0	0	2	0	0	1
<b>WEST NORTH CENTRAL</b>												
Minnesota:												
Duluth	1	0	0	0	6	0	1	0	2	0	0	0
Minneapolis	1	0	0	0	18	1	11	0	15	0	0	0
St. Paul	2	0	0	0	9	0	4	0	14	0	0	1
Missouri:												
Kansas City	1	0	1	2	139	0	7	0	7	0	0	4
St. Joseph	0	0	0	0	13	0	0	0	1	0	0	0
St. Louis	2	0	4	1	96	5	12	0	17	0	0	2

## City reports for week ended Mar. 9, 1946—Continued

	Diphtheria cases	Eencephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Polymyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
<b>WEST NORTH CENTRAL—continued</b>												
North Dakota:												
Fargo.....	0	0		0		0	1	0	1	0	0	
Nebraska:												
Omaha.....	1	0		1	30	0	3	0	9	0	0	1
Kansas:												
Topeka.....	0	0		0	170	0	1	0	7	0	0	4
Wichita.....	0	0		0	89	0	1	1	2	0	0	6
<b>SOUTH ATLANTIC</b>												
Delaware:												
Wilmington.....	2	0		0	22	0	2	0	3	0	0	1
Maryland:												
Baltimore.....	12	0	2	0	261	1	8	0	42	0	0	11
Cumberland.....	0	0		0		0	1	0	3	0	0	
Frederick.....	0	0		0		0	0	0	0	0	0	
District of Columbia:												
Washington.....	0	0	2	1	152	2	7	0	36	0	1	4
Virginia:												
Lynchburg.....	0	0		0	5	0	1	0	3	0	0	3
Richmond.....	0	0	3	3	21	0	1	0	9	0	0	1
Roanoke.....	0	0		0	7	0	0	0	3	0	0	
West Virginia:												
Wheeling.....	0	0		0	6	2	0	0	1	0	0	5
North Carolina:												
Raleigh.....	1	0		0	29	0	1	0	2	0	0	1
Wilmington.....	0	0		0	24	0	0	0	2	0	0	2
Winston-Salem.....	0	0		0	1	1	1	0	3	0	0	7
South Carolina:												
Charleston.....	1	0	7	1	22	0	1	0	0	0	0	4
Georgia:												
Atlanta.....	1	0	1	1	5	2	2	0	6	0	0	
Brunswick.....	0	0		0	3	0	1	0	0	0	0	
Savannah.....	0	0	4	2		0	0	0	1	0	0	
Florida:												
Tampa.....	0	0		0	38	1	0	0	0	0	0	2
<b>EAST SOUTH CENTRAL</b>												
Tennessee:												
Memphis.....	1	2	2	2	30	0	4	1	2	0	0	7
Nashville.....	0	0		1	29	1	6	0	4	0	0	1
Alabama:												
Birmingham.....	1	0	4	0		0	5	0	2	0	0	
Mobile.....	1	0	10	0	1	0	4	0	0	0	1	
<b>WEST SOUTH CENTRAL</b>												
Arkansas:												
Little Rock.....	0	0	2	0	3	0	1	0	0	0	0	
Louisiana:												
New Orleans.....	0	0	12	3	3	1	10	3	4	0	1	
Shreveport.....	0	0		1		1	4	0	0	0	0	
Texas:												
Dallas.....	0	0		0	5	0	5	0	6	0	0	
Galveston.....	0	0		0	8	0	0	0	3	0	0	1
Houston.....	1	0		1	2	0	7	1	0	0	0	
San Antonio.....	0	0		0	15	0	8	0	1	0	0	4
<b>MOUNTAIN</b>												
Montana:												
Billings.....	0	0		0	1	0	0	0	0	0	0	
Great Falls.....	1	0		0	1	0	0	0	1	0	0	
Helena.....	0	0		0		0	0	0	0	0	0	
Missoula.....	0	0		0		0	0	0	0	0	0	
Idaho:												
Boise.....	0	0		0	3	0	1	0	0	0	0	
Colorado:												
Denver.....	1	0	3	0	136	0	0	0	16	0	0	4
Pueblo.....	0	0		0	6	0	2	0	4	0	0	
Utah:												
Salt Lake City.....	0	0		0	71	0	4	0	1	0	0	5

City reports for week ended Mar. 9, 1946—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Pollomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
<b>PACIFIC</b>												
Washington:												
Seattle.....	2	0	0	0	227	1	3	0	7	0	0	7
Spokane.....	0	0	1	1	107	0	3	0	2	0	0	-----
Tacoma.....	0	0	0	0	41	2	0	0	0	0	0	8
California:												
Los Angeles.....	3	1	13	2	240	3	6	1	42	0	0	14
Sacramento.....	3	0	0	0	148	0	2	0	2	0	0	-----
San Francisco.....	2	0	5	1	328	3	10	1	18	3	0	2
Total.....	84	4	93	40	10,797	71	378	9	1,129	3	7	527
Corresponding week, 1945.	62	-----	86	29	776	-----	443	-----	1,936	0	7	615
Average, 1941-45.	67	-----	258	144	5,690	-----	1,505	-----	1,736	1	13	815

<sup>1</sup> 3-year average, 1943-45.

<sup>2</sup> 5-year median, 1941-45.

*Dysentery, amebic.*—Cases: New York, 2; Winston-Salem, 1.

*Dysentery, bacillary.*—Cases: New York, 2; Detroit, 3; Los Angeles, 3.

*Dysentery, unspecified.*—Cases: Cincinnati, 2; San Antonio, 7.

*Typhus fever, endemic.*—Cases: Savannah, 1; Tampa, 2; Birmingham, 2; New Orleans, 1; Los Angeles, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (estimated population, 1943, 34,164,000)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Pollomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England.....	7.8	0.0	5.2	5.2	627	13.1	101.9	0.0	240	0.0	2.6	295
Middle Atlantic.....	11.1	0.5	3.7	4.2	1,848	10.2	52.3	0.5	232	0.0	1.4	68
East North Central.....	9.9	0.0	4.3	3.1	2,472	10.5	45.8	0.0	143	0.0	0.0	96
West North Central.....	15.9	0.0	9.9	8.0	1,134	11.9	81.6	2.0	149	0.0	0.0	36
South Atlantic.....	28.5	0.0	31.8	13.4	998	15.1	43.5	0.0	191	0.0	1.7	69
East South Central.....	17.7	11.8	94.4	17.7	354	5.9	112.1	5.9	47	0.0	5.9	47
West South Central.....	2.9	0.0	40.2	14.3	103	5.7	100.4	11.5	40	0.0	2.9	14
Mountain.....	15.9	0.0	23.8	0.0	1,731	0.0	55.6	0.0	175	0.0	0.0	71
Pacific.....	15.2	1.6	30.0	6.3	1,725	14.2	38.0	3.2	112	4.7	0.0	49
Total.....	12.9	0.6	14.2	6.1	1,652	10.9	57.9	1.4	173	0.5	1.1	81

## TERRITORIES AND POSSESSIONS

### Panama Canal Zone

*Notifiable diseases—January 1946.*—During the month of January 1946, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Panama		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox.....	3	-----	1	-----	5	-----	-----	-----	9	-----
Diphtheria.....	23	-----	-----	-----	1	-----	9	-----	33	-----
Dysentery:	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Amebic.....	2	-----	1	-----	2	1	1	-----	6	1
Bacillary.....	2	-----	-----	-----	-----	-----	-----	-----	2	-----
Malaria <sup>1</sup> .....	10	1	-----	-----	78	-----	63	4	151	5
Measles.....	-----	-----	-----	-----	1	-----	-----	-----	1	-----
Meningitis, meningococcus.....	-----	-----	4	-----	1	-----	-----	-----	5	-----
Mumps.....	-----	-----	2	-----	3	-----	-----	-----	5	-----
Paratyphoid fever.....	1	-----	-----	-----	3	-----	-----	-----	4	-----
Pneumonia.....	-----	14	-----	8	58	-----	-----	2	<sup>2</sup> 58	24
Polomyelitis.....	-----	-----	-----	-----	-----	-----	2	-----	2	-----
Relapsing fever.....	-----	-----	-----	-----	1	-----	-----	-----	1	-----
Tuberculosis.....	-----	21	-----	6	10	4	-----	8	<sup>2</sup> 10	39
Typhoid fever.....	1	-----	-----	-----	1	-----	3	-----	5	-----
Typhus fever.....	1	-----	-----	-----	-----	-----	-----	-----	1	-----
Whooping cough.....	-----	-----	-----	-----	3	-----	-----	2	<sup>2</sup> 3	2

<sup>1</sup> 19 recurrent cases.

<sup>2</sup> In the Canal Zone only.

## FOREIGN REPORTS

### CANADA

*Provinces—Communicable diseases—Week ended February 16, 1946.—*  
 During the week ended February 16, 1946, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox.....		8		73	231	23	25	15	91	466
Diphtheria.....		5	3	19	11	3		2	1	46
Dysentery:										
Bacillary.....				1						1
Unspecified.....					1					1
Encephalitis, infectious.....					1					1
German measles.....		13		19	25		2	7	10	76
Influenza.....		132			259	23			112	526
Measles.....		52	12	357	1,301	5	7	5	29	1,768
Meningitis, meningococcus.....				2	1			1		4
Mumps.....			1	97	139	29	22	51	113	452
Scarlet fever.....		11	8	79	67	9	8	10	26	218
Tuberculosis (all forms).....		11	4	102	59	10	36	18	41	281
Typhoid and paratyphoid fever.....				5	1				2	8
Undulant fever.....				2	1					3
Veneral diseases:										
Gonorrhoea.....	1	14	12	138	264	54	53	45	93	674
Syphilis.....		10	5	99	107	18	12	10	44	305
Whooping cough.....				148	23	2		3		176

### CUBA

*Habana—Communicable diseases—4 weeks ended March 2, 1946.—*  
 During the 4 weeks ended March 2, 1946, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Chickenpox.....	2		Measles.....	1	
Diphtheria.....	13		Tuberculosis.....	6	2
Malaria.....	1		Typhoid fever.....	22	1

*Provinces—Notifiable diseases—4 weeks ended February 23, 1946.*—During the 4 weeks ended February 23, 1946, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana <sup>1</sup>	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer.....	3		7	16	3	11	40
Chickenpox.....		9	1	1	1	3	15
Diphtheria.....		19	3			1	23
Hookworm disease.....		23		1			24
Leprosy.....		5			1	1	7
Malaria.....	5	3			10	119	137
Measles.....		1			3		4
Tuberculosis.....	7	33	4	31	36	42	153
Typhoid fever.....	11	45	6	22	10	61	155
Whooping cough.....			2				2
Yaws.....						1	1

<sup>1</sup> Includes the city of Habana.

### STRAITS SETTLEMENTS

*Singapore—Poliomyelitis.*—According to information dated March 11, 1946, 21 cases of poliomyelitis with 2 deaths were reported in Singapore for the period March 1 to March 6, 1946, making a total of 161 cases with 15 deaths reported since the beginning of the outbreak. The disease is said to be spreading to the mainland. Necessary precautions are being taken.

### REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

#### Plague

*Peru—Lima Department.*—For the month of January 1946, 11 cases of plague with 2 deaths were reported in Valley Huaura, Chancay Province, Lima Department, Peru. During the same period plague infection in rodents was also reported in the cities of Chimbote, Chin-goyal, and Huacho.

#### Smallpox

*Mexico.*—For the month of January 1946, 77 cases of smallpox were reported in Mexico. States reporting the highest incidence are: Nayarit, 49 cases; Guanajuato, 13 cases; Jalisco, 8 cases.

*Morocco (French).*—For the period February 21–28, 1946, 177 cases of smallpox were reported in French Morocco, including cases reported by regions as follows: Agadir and frontier districts, 19; Casablanca, 34; Fez, 5; Marrakech, 67; Meknes, 5; Oujda, 37; Rabat, 10.

*Venezuela.*—For the month of February 1946, 159 cases of smallpox were reported in Venezuela. States reporting the highest incidence are: Cojedes, 92; Guarico, 30; Nueva Esparta, 15.

**Typhus Fever**

*Belgian Congo.*—For the week ended February 23, 1946, 145 cases of typhus fever including 5 cases of murine typhus fever, were reported in Belgian Congo.

*Mexico.*—For the month of January 1946, 92 cases of typhus fever were reported in Mexico. States reporting the highest incidence are: Mexico, D. F., 27; Mexico, 11; Guanajuato, 9; Hidalgo, 8.

*Morocco (French).*—For the period February 21–28, 1946, 198 cases of typhus fever were reported in French Morocco, including cases reported by regions as follows: Agadir and frontier districts, 4; Casablanca, 65; Fez, 32; Marrakech, 41; Meknes, 22; Oujda, 1; Rabat, 33.

*Turkey.*—For the week ended March 9, 1946, 77 cases of typhus fever were reported in Turkey, including cases reported in ports as follows: Icel, 1; Istanbul, 2; Izmir, 2.

**Yellow Fever**

*Venezuela—Trujillo State—Escuque District—Boqueron.*—A telegraphic report dated March 6, 1946, states that 1 case of yellow fever has occurred in Boqueron, Escuque District, Trujillo State, Venezuela.

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