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—Editorial—

Education for Tuberculosis Nursing

The new Instructional Plan for Basic Tuberculosis Nursing, published in July of this year by the National League of Nursing Education, is an imaginative attack upon one of the most difficult problems associated with tuberculosis control—the deficit of professional tuberculosis nurses.

An article in the August issue of PUBLIC HEALTH REPORTS pointed out that tuberculosis hospitals in the United States are understaffed. At the present time many hospitals are forced to make up the deficiencies in trained professional nurses by using untrained workers and volunteers. Sometimes the standard of patient care falls because there are not enough hands to do all the day-in-day-out work that is necessary. One of the basic reasons for the deficit, according to the article, is that many schools of nursing up to now have given little instruction in tuberculosis and even less clinical experience.

The National League of Nursing Education has always believed that the public holds each profession responsible . . . "for determining what educational standards and programs are necessary for the proper selection and preparation of its members . . ." They have issued the new Instructional Plan as the statement of the profession itself in an effort to give tuberculosis nursing a place in the curriculum commensurate with the importance of the disease as a killer and waster of human lives.

The 1937 Curriculum Guide issued by the National League of Nursing Education devoted only three paragraphs to tuberculosis. Under the heading, Nursing in Communicable Disease, it recommended 15 hours of instruction devoted chiefly to the pathology and treatment of tuberculosis.

The new Plan is much more detailed and specific. The recommended course of study is from 45 to 60 hours depending upon previous instruction, with 180 to 240 hours of practice. It is divided into

This is the forty-fourth of a series of special issues of PUBLIC HEALTH REPORTS devoted exclusively to tuberculosis control, which will appear in the first week of each month. The series began with the March 1, 1946, issue. The articles in these special issues are reprinted as extracts from the PUBLIC HEALTH REPORTS. Effective with the July 5, 1946, issue, these extracts may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 10 cents a single copy. Subscriptions are obtainable at $1.00 per year; $1.25 foreign.

eight units, beginning with orientation to acquaint the student with the similarities and differences between tuberculosis nursing and other kinds of nursing. It continues with a unit called The Nature of Tuberculosis which presents a brief history of the disease, its etiology, microbiology and method of transmission, the body's reaction to an invasion of the bacilli and complications and co-existent conditions and diseases.

The third unit is devoted to socioeconomic factors associated with tuberculosis. It suggests a study of epidemiology; of the various facilities for diagnosis such as hospitals, clinics and health services; and of the functions of national and local tuberculosis associations. It also contains a detailed discussion of welfare agencies, both official and unofficial, and of legislation on residence requirements, isolation of patients, compensation, case reporting and the means test. In this section, instruction in health education is also recommended.

The next unit deals with prevention and includes, after a brief emphasis upon the maintenance of positive health, intensive instruction in case-finding methods, differential diagnosis, classification of cases, and immunization. The role of the nurse in each of these activities is discussed and her part in educating both the patient and his family about health and disease is stressed.

Personal and psychological factors affecting recovery are the subject of the fifth unit. The student nurse is to be given preparation for dealing with a patient's reaction to the diagnosis of tuberculosis and the personal problems that arise in the course of diagnosis and treatment. Special attention is given to the subject of developing satisfactory relationships between nurse and patient.

Only after these highly important considerations have been impressed upon the student, does the plan call for training in strictly medical and surgical procedures. Even in this part of the course the comfort and well-being of the individual patient is kept constantly in the foreground.

The last unit of instruction is rehabilitation, and here again emphasis is placed not only upon technicalities such as referrals and official rehabilitation aids, but also upon the welfare of the patient himself.

Such a course of study will train nurses who can make an invaluable contribution to the care of tuberculous patients. The next step, of course, is to get the plan adopted by as many schools as possible. In the past the recommendations of the National League of Nursing Education have carried great weight among school administrators, supervisors and head nurses, some 4,000 of whom are members of the League. In all probability there will be equal willingness to carry out the present recommendations.

School directors are reluctant, however, to place their students on tuberculosis services unless they can be protected against infection.

The practice of aseptic techniques is imperative for the protection of everyone who comes in contact with the disease. Both in the nursing schools and on tuberculosis services a health program with repeated tuberculin, X-ray, and general examinations should be maintained for all student nurses and other personnel throughout their training. Proper personal hygiene must be reinforced by good nutrition and good living conditions. Patients must be segregated, and vigilance against the spread of bacilli must never be relaxed with open cases of tuberculosis. Such a program is an essential correlative of the new Instructional Plan.

The National League of Nursing Education Committee on Curriculum has recognized the need for a plan to incorporate experience in tuberculosis nursing into the curriculum of basic nursing education. They are offering the profession the well-formulated plan by the Joint Tuberculosis Nursing Advisory Service as a workable one which stands a chance of meeting this need. Admittedly, there will be difficulties in putting the plan into operation. However, it would seem that there are none that cannot be resolved if the schools of nursing, tuberculosis sanatoria, and hospital administrators in general hospitals recognize the benefits to be obtained. Sanatoria and tuberculosis services in general hospitals will be able to draw upon an increasing number of nurses thoroughly grounded in tuberculosis. As they do so, many of the onerous conditions which have been caused by the deficit of nurses can be alleviated, and a long step will be taken toward providing better care for tuberculous patients and more positive assistance from nurses in the entire tuberculosis control program.

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Prospectus of Research in Mass BCG Vaccination

By Carroll E. Palmer, M. D.*

The antituberculosis mass vaccination program of the Joint Enterprise[1] offers an almost unparalleled opportunity to study tuberculosis on a world-wide basis. At various times during the planning of the program, suggestions have been made to take full advantage of this opportunity, and at present a beginning has been made in this direction. In general, however, emphasis has been laid primarily on a relatively few statistical studies. To limit the program to such studies is to neglect the chance to make major contributions to the whole broad field of tuberculosis. The tuberculin testing and vaccination program should be viewed as offering a tremendous facility for medical research.

In considering an extensive medical research program, two basic facts should be recognized:

First, it must be admitted in clear and unequivocal terms that strict scientific proof of the effectiveness of BCG vaccination in the control of human tuberculosis is not available. This is true despite the fact that millions of persons have been given BCG during the past 20 years and despite the very suggestive evidence of a few, small scale studies. It may still be true 20 years from now, unless an energetic and careful evaluation of the effects of BCG programs are undertaken.

Second, it must be realized that a major responsibility for studying the effects of the program will fall upon national and local groups. An international research organization can only advise and assist in a long range program of evaluation and research.

As viewed here, the medical research program of the Joint Enterprise may be classified under three major headings:

1. Research on the details of techniques, procedures, and results of tuberculin testing and immunization.

2. Basic epidemiological research on tuberculosis infection and disease.

3. Evaluations of the BCG program in the prevention of tuberculosis morbidity and mortality.

It should be recognized that it is neither necessary nor desirable to set up entirely separate studies on these three aspects of the research program. On the contrary, the research work should operate as a

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[1] A cooperative effort between the United Nations International Children's Emergency Fund, the Scandinavian voluntary organizations (Danish Red Cross, Norwegian Help for Europe and Swedish Red Cross) and the World Health Organization.

coordinated whole, each project being designed to contribute as much as possible to all of the research objectives. Further, it is recognized that the investigative aspects of the program must be so integrated into the service program as not unduly to disturb the main objective of actually testing and vaccinating as many persons as possible. Most careful planning of the research program, both of the field work and of the statistical analysis, is therefore necessary.

The present prospectus for medical research for the Joint Enterprise represents mainly an attempt to set down examples of the type of investigations that are needed and should be done as an integral part of the service program.

Selecting Persons for Vaccination

One of the most pressing problems that require further study in connection with the practical aspects of the Joint Enterprise program concerns criteria for selecting persons for vaccination. At the present time several different products are being used, by several different methods and combinations of methods. Also, the rules have recently been changed to use 10 rather than 33 or 100 TE[2] for the final Mantoux test. There is in practice considerable variation in the way all of this is being carried out. It should be admitted, furthermore, that there is not general agreement on just what degree of tuberculin sensitivity should be used to separate persons into those needing and those not needing vaccination. In addition, it is not known whether the criteria for selecting persons for vaccination should be varied with age, tuberculinization of the population, country or nationality groups. Lack of uniformity in this part of the work makes it very difficult to obtain full use of the statistical tabulations being prepared. For these reasons it is essential, at once, to undertake certain studies which may be expected to furnish more conclusive evidence regarding precise as well as practical methods for managing the prevaccination testing.

In order to get information on this problem a number of separate projects should be undertaken. All of them, however, involve very difficult, fundamental studies on the specificity of the tuberculin test but much information of practical value may be obtained if arrangements can be made in the routine service program for doing duplicate tests, using different tuberculin products and different methods of application.

Allergy-producing Characteristics of Vaccines and Their Administration

Vaccination programs for tuberculosis in some parts of the world are not likely to be successful until a preserved vaccine is developed

[2] Tuberculin unit:1/50,000 mg. standard PPD=1/100 mg. standard Old Tuberculin.

which is satisfactory in producing a high level of allergy and which causes relatively few complications from the vaccination. A number of preserved BCG and other products are available for trial now, and others are being developed. Further, there is at this time considerable disagreement on the adequacy of different BCG vaccines, and as well on methods of giving the vaccine. One of the most urgent parts of the research program for the Joint Enterprise, therefore, should be to set up studies to determine the allergy producing qualities of different vaccines, both fresh and preserved, on the different methods of giving the vaccines; and on complications of the vaccination reactions.

Intensive studies along this line are already going forward in the pilot studies in Paris and in the United States, the results of which can be used as guides for some of this work. It is evident, however, that this work can be considered only as relatively small pilot investigations and that large-scale studies should be made a part of the Joint Enterprise research program. It must be recognized that investigation on this subject would consist of several separate field projects, each involved with the comparison of two or more vaccines or methods.

Essential features of these projects are as follows:

1. Prevaccination tuberculin testing according to standard, uniform procedures.

2. Separation of the persons to be vaccinated, by a purely chance selection scheme, into two or more comparable groups, each group to receive a different vaccine, or vaccine given by a different method.

3. Postvaccination tuberculin testing according to standard procedures, at suitable intervals, to determine the level of tuberculin sensitivity attained.

4. Periodic observation of the vaccinated persons for 6 months to 1 year to determine the types and frequencies of complications of the vaccination.

It probably should be mentioned that the essential objective of these studies is limited to a determination of the allergy producing qualities of the different vaccines and the different methods of giving them, under the assumption that the best vaccine and method are the ones which produce the highest degree of allergy for the longest period of time. Such an assumption may or may not be warranted, and conclusions drawn from the studies should take this into account.

Effect of Revaccination

Although knowledge of the value of BCG vaccination is believed sufficient for the present practical program, there can be no doubt that knowledge of the effect and value of revaccination is almost completely lacking. One of the critical problems which faces the

Joint Enterprise, in its work at present and certainly for the future, is therefore to obtain as much information as is possible on a long list of questions which may be raised about revaccination. Areas or communities must be found where long-range extensive projects on this subject may be undertaken.

Project on the Effect of Vaccinations Without Revaccination. The essentially critical points in these projects involve the follow-up study of morbidity and mortality in large population groups, where it is possible to make systematic and repeated postvaccination tuberculin tests and where revaccination is not done. The general plan is as follows: The routine service program of tuberculin testing and vaccination would be carried out in the study areas. Postvaccination tuberculin tests, on all vaccinated cases, would then be done at 6–8 weeks, 6 months, 1 year, 2 years, 3 years, and 4–5 years after vaccination. *Regardless of the results of these tuberculin tests, revaccination must not be done.* During the 4–5 year period following vaccination, an efficient, well-worked-out plan must operate for collecting records on all cases and deaths from tuberculosis among the part of the population that was vaccinated.

Results of these studies would be expressed in relatively simple terms: the frequency or rates of tuberculosis morbidity and mortality among different groups of the vaccinated population separated according to the degree and duration of allergy produced by one vaccination. The main objective of the study is thus to determine whether or not there is a difference in the protection afforded by BCG, which can be related to allergy and, therefore, to the need and probable value of revaccination. If, at the same time, morbidity and mortality rates are obtained for the tuberculin-positive members of the vaccinated segment of the population, valuable information would also be obtained to study the differences between natural and artificially produced allergy.

It should be recognized that the results of such a study as this may not be interpreted as a strictly scientific evaluation of the effectiveness of BCG. Thus it may be argued that the classification of individuals according to the degree and duration of allergy following BCG serves only to classify individuals into groups according to their inherent or natural resistance or susceptibility to tuberculosis. That such a differential classification of a population is possible would be of great practical value in our knowledge of tuberculosis.

While it is not possible to argue a priori that such a study would furnish no rigorous proof of the value of BCG, it is quite possible that the results would give extremely valuable presumptive evidence on the effectiveness of BCG. For example, if it were found that nearly all cases of the disease and deaths among the vaccinated occurred in a relatively small group that did not develop a strong allergy after

vaccination, it might become immediately practical to introduce a strong program of revaccination. Further, depending on the actual rates of morbidity and mortality found for the different groups defined according to the levels of allergy which develop following a single vaccination, it may be possible to draw significant inferences regarding the value of BCG.

Projects on the Effects of Multiple Revaccination on Allergy. The importance of obtaining information on questions of revaccination, especially in connection with future work by the Joint Enterprise and by local tuberculosis control programs during the next few years, makes it undesirable to wait for the results of the first projects before undertaking certain others.

First, a relatively small scale, very intensive study should be done at once to obtain details of the effects of revaccination on allergy. The critical aspects of the project involve standard testing and vaccination, followed in 6–8 weeks by revaccination of all who have not attained a high degree of allergy, with a repetition of the revaccination again in 6–8 weeks for those who still are not highly allergic. The results of this project should furnish details on the relationship between repeated vaccinations and attained allergy, the dangers and complications of revaccination, the percentage of individuals who repeatedly do not develop allergy.

Projects on the Effects of Multiple Revaccination on Tuberculosis Disease and Mortality. As soon as the results of the above study are available, a large scale project should be undertaken which involves routine testing and vaccination followed by repeated tuberculin testing and revaccinations until the whole group of vaccinated are made highly allergic to tuberculin. At the same time follow-up procedures would be undertaken to collect data for a 4–5-year period on the morbidity and mortality of the vaccinated population. If current theories on the effectiveness of BCG are correct, practically no disease or deaths due to tuberculosis should appear among the vaccinated. This project represents one of the most significant that can be undertaken as part of a purely service program in which it is impossible to have a comparable group of unvaccinated "controls." It should be easily possible to obtain cooperation for such programs, set up in several areas or communities, since they can be considered as superlative demonstrations of the preventive potentialities of BCG. The chief difficulty of such programs is to find sufficiently stable areas in which adequate follow-up of tuberculosis morbidity and mortality can be obtained for a number of years. The chief advantage of such studies lies in the fact that they may show that complete protection against tuberculosis is achieved if all the vaccinated attain a high degree of allergy to tuberculin.

Rates of Tuberculous Infection

The present plan to obtain filled out records of tuberculin tests and vaccinations for local communities offers the opportunity for a wide variety of epidemiological studies. One of the first that should be undertaken is to obtain estimates of the rates at which children are becoming infected with the tubercle bacillus. It is proposed to do this by estimating the average annual rates of infection for children between the ages of 6 and 14 years in the different areas where the work is being done. From the data now available, it seems likely that reasonably accurate estimates of the annual infection rate can be obtained without any substantial modification of the present working and reporting arrangements. The actual estimation of the rates would require a considerable amount of statistical calculations, but the work would not be excessive. The reason for limiting the rates to the age group, 6–14 years, is that figures below 6 and above 14 are not generally extensive. Below 6 years there is considerable selection of the population and the groups cannot usually be considered representative of the general population. Above 14, the percentage of positive reactions is, in many places, too high to make such single rates very satisfactory. For this, and for any other use to be made of the material from the records, it must be realized that the accuracy of the original material is of great importance. Also the uniformity of the field work bears directly on the use of the records. Variations in materials used for testing and in testing procedures will directly affect the use and value of the statistics.

Average annual infection rates for school children may be the best single index of tuberculosis we can obtain for many countries today, since morbidity and mortality rates are not very reliable. Rates for children 6–14 years of age include children born between 1934 and 1942, and will reflect a very wide range of conditions existing before, during, and after the war. On the whole, however, such rates ought to furnish a fair index of the frequency of effective contact with the tubercle bacillus. In many places the rates would mainly represent "familial" or "home" contacts with open cases of tuberculosis. However, in interpreting the results, attention will have to be directed to the possible role of bovine tuberculosis.

It may be anticipated that accurate yearly infection rates for different countries and local areas will be of great value both immediately and in the future. Also, the present moment will be the last chance to obtain such rates for a long time to come. In this connection it should be remembered that the present BCG program is about to destroy the much discussed value of the tuberculin test as an epidemiological index of tuberculosis. For this reason alone, it would seem justifiable to expend a fair amount of energy to document the program in this

way, and perhaps be able to defend it against unwarranted criticism in the future.

For immediate practical purposes, annual infection rates for school children may be used in a purely descriptive way to show the differences which exist today in the status of tuberculosis in various countries and their subdivisions, and to do so in a far more accurate way than has ever before been possible. For many countries, an accurate comparative description in these terms may be made the foundation for future tuberculosis control programs. As such, the descriptions may transcend in usefulness the cruder, less accurate, and more complex tuberculosis mortality rates. In this connection, it should be recognized that annual tuberculosis infection rates have not been used before simply because they were never actually available with sufficient coverage to make them useful, and that they would not become available now except for the well-controlled BCG vaccination program.

With respect to other uses of well-determined infection rates for school children, it must suffice here simply to give one illustration.

One of the problems which will eventually face the Joint Enterprise and also the individual countries in the program will be to evaluate the effect that the vaccination has had on tuberculosis morbidity and mortality. In doing this, however, it will be necessary to take account of many factors which influence deaths from tuberculosis. Accurate knowledge of the infection rates for children before they are vaccinated will constitute one of the most important of such factors. Details of the exact way in which the infection rates can be used will need to be studied, but it must be evident that the long-range effect of a vaccination program is dependent not only on the proportions of uninfected persons who were vaccinated, but also on some measure or index of how much contact these persons were probably subjected to before and after vaccination.

Effectiveness of BCG Vaccination

Indirect Studies. While it is true that direct evidence on the specific value of BCG as a preventive of tuberculosis can be derived only from strict scientific studies involving randomly selected unvaccinated "controls," it should be possible to utilize the vast experience of the Joint Enterprise to obtain presumptive evidence on this question. One of the questions often posed in this connection is that persons who refused to be vaccinated can be followed up, along with the vaccinated, and that the value of BCG can be determined by comparing mortality rates among the vaccinated with those of the group which refused. The answer usually given to the question is that this procedure is entirely unsatisfactory; that one can learn nothing from such studies. This is not necessarily true.

By the addition of a relatively few observations it should be possible to get information on important differences between the group that accepts, and the one that refuses vaccination. From this information it should be possible to judge something of the comparability of the two groups and to what extent comparison between them would be justifiable.

For example, relatively accurate data on "history of contact with tuberculosis," preferably obtained from the parents of each child, could be used to determine whether the vaccinated and "refused" groups are comparable with respect to the likelihood of past and future exposure to the disease. In the same way and for certain other purposes, information on whether or not a member of the family had died of tuberculosis could be used. A very brief review of this type of information, made in Germany in June, indicated that the groups who accept vaccination contain a far greater percentage of persons with a history of contact than the group that refuses. If this finding could be established as fact, and later it were found that a much higher frequency of disease and deaths occurred among the nonvaccinated, it could be argued that in spite of a higher rate of exposure to tuberculosis, in the past and probably in the future, BCG had contributed to the reduction of the disease among the vaccinated. Very strong presumptive evidence of the value of BCG would accrue if the rate of disease and deaths from tuberculosis among the vaccinated were only a very small fraction of the rate among the tuberculin-negative nonvaccinated.

Another simple way of gaining information on the comparability of the vaccinated and nonvaccinated groups would be to ask, before the first tuberculin test is given, whether or not permission to vaccinate would be granted by the parents. With this information available, it could be determined whether there is a difference in the frequency of positive tuberculin reactors among the two groups of the population, the one where the parents accept, the other where the parents reject vaccination.

The collection of data such as these, and others, should be carefully considered as possible additions to the present program in those countries or subdivisions where a significant proportion of the population do not favor vaccination. By so doing it may be possible to capitalize on otherwise undesirable situations to serve the extremely important purpose of adding to our knowledge of the usefulness of BCG. In considering this matter, however, it must be remembered that to make the material fully useful would require the most careful kind of long-term follow-up of individuals in the population, those vaccinated and those not. At a minimum, this would entail keeping, for a number of years, the file of vaccination record cards against which

deaths from tuberculosis are periodically matched. In order not to destroy the value of the investigation, it would be necessary, also, that no further vaccination program be undertaken in the community. This, obviously, may be a difficult and undesirable complication, but it is not apparent how it can be avoided—unvaccinated "controls" in this project, as in any other, means what it says. Unless there can be agreement on this point, it is foolish to spend time and energy on such a study.

Direct Studies. At the time of the subcommittee meeting in Paris in June, the problem of strictly scientific control studies involving comparable groups of randomly-selected-unvaccinated "controls," was discussed. The consensus of that discussion was that such studies are impossible in the present Joint Enterprise program. The importance of the matter, however, would certainly seem to justify its reconsideration. No further comments will be made here, except to state that some way must be found to carry out such studies in some place, and soon.

Miscellaneous Studies and Projects

In addition to the investigations already suggested, there are many others that should be carefully considered. Among these are some which may be viewed as having only academic or theoretical interest; others consist merely of suggestions regarding the collection and handling of the records in such ways as to make them more readily usable for a wider variety of studies; still others involve projects designed to obtain information not only of use in tuberculosis control but also conceived as contributions to the broader aspects of epidemiology and public health in general.

Studies on Familial Characteristics of Tuberculin Sensitivity. From the long history of the study of tuberculosis, it is clear that the primary factor in the spread of the disease is personal contact with an infectious case. On the other hand, there is recurring evidence that familial characteristics or hereditary and racial factors also play some role in the disease. Records now being collected in the BCG campaign offer a remarkable opportunity to study certain aspects of this problem and one specific project is suggested to illustrate what can be done. The objective of this project would be to determine whether or not there are familial similarities in the capacity to become allergic to tuberculin, and whether these similarities are in any way related to a tendency to develop the disease or die from it.

In order to study this question in a preliminary way, it would be necessary, in addition to items now being observed, to collect information which would allow the grouping of children into family aggregates, and to collect information on the history of tuberculosis disease

and death in the family. In certain localities, therefore, a special record card could be used which would call for the mother's and father's name, and answers to a few questions on history of tuberculosis. Grouping the cards for children in the same family would furnish material on prevaccination tuberculin sensitivity (naturally acquired sensitivity) postvaccination sensitivity (artificially produced sensitivity) and familial response to disease. The statistical analysis of these records would be rather complex but quite feasible, and should furnish important information on questions of familial resistance and susceptibility to tuberculosis. Obviously there are many additions and ramifications of such investigations which should be carefully considered and undertaken. To fail to do so is to miss some of the rare opportunities for fundamental research which the work of the Joint Enterprise has to offer.

Studies on Histoplasmin Sensitivity and Histoplasmosis. During the last few years in the United States, evidence has been brought out that *Histoplasma capsulatum* (or a closely related fungus) causes not only a few rare cases of fatal histoplasmosis, but also a mild subclinical disease which in may ways so closely resembles subclinical tuberculosis as to be frequently confused with it. Although fatal histoplasmosis is thought to be world-wide in its distribution, almost nothing is known outside the United States regarding the mild subclinical form. It is suggested, therefore, that the intradermal skin test with histoplasmin be widely used on a small sampling basis in all countries where the BCG work is being done. The extra work in investigating this problem would be almost negligible. Histoplasmin for the tests can be supplied from America. The only difficulty in the work involves finding representative schools in a few areas in each country where no objection could be raised to doing duplicate tests, one intradermal histoplasmin test along with the tuberculin test done for BCG. At least 100,000 tests in the United States can be cited for evidence that the histoplasmin test is harmless.

The objective of these preliminary studies is, of course, simply to determine whether sensitivity to histoplasmin exists in any of the areas where the vaccination program is being carried out.

Preservation and Handling of Records. The magnitude and importance of the present BCG campaign makes it imperative to document the program in the most careful and complete way. Obviously, no one can say with assurance at this stage of the work, just what information about the program will be needed in the future. Accordingly, careful plans should be made now to preserve intact some of the original cards and records of the program. At present, plans are that the original cards will be held for the use of local communities. While it is essential that all possible use be made of the records in this way, it is quite necessary that provision be made for the permanent preserva-

tion of representative samples of the original records for a number of whole communities in each country. The handling of this problem should be the duty and responsibility of persons who fully appreciate the importance of the matter and who quite completely understand the value and management of large record files. It is naive to believe that present arrangements for the preservation of the original records will be satisfactory for future studies except in rare instances. Details of this work must be studied, but the specific suggestion is made that microfilm copies be made of all the records for several large communities, and that these be stored separately in a safe place, perhaps in the archives of WHO.

Studies of Tuberculosis Mortality Data. It seems inevitable that sooner or later most countries in the BCG program will want to measure the effect of the vaccination work in terms of changes in tuberculosis mortality. To a great extent this type of work will probably be of prime importance to the individual countries and much of the work will necessarily fall upon the local vital statistics offices, although attempts to measure the effect of the program as a whole will be desirable as an activity of an international group or organization.

Preparations for this work should be started as soon as practicable. A statistician familiar with the management of vital records and with the objectives of this special work should visit each country and discuss the problems with the local persons responsible for vital statistics. To the extent that it is feasible to do so, uniform systems should then be started, not only to collect mortality data in the future but also to obtain the best possible material available on the current status of tuberculosis mortality in each country. In addition, it would be desirable to consider ways and means of obtaining data on morbidity. Questions of nomenclature and classifications are of great importance in all of this work, and it may be anticipated that assistance in the handling of these matters can be obtained from international organizations and committees.

At the time of visits of the statisticians to the various countries, the opportunities for, and difficulties of, doing long-time follow-up studies should be thoroughly explored.

Studies on Comparative Findings of Tuberculin Tests and X-ray Examinations. From individual observers in different parts of the world, reports are available of the frequency of abnormal X-ray findings in specific groups of the population, and descriptive material on what these changes are. However, data on X-ray changes and their relationship to tuberculin sensitivity are very limited, and because of the variation in methods used for the determination of tuberculin sensitivity, and in the interpretation of the X-ray film, only a very incomplete picture is at present available on the subject.

During the course of the prevaccination tuberculin testing of the

different population groups in different parts of the world, an exceptional opportunity for obtaining information on this subject is provided, if, in representative areas of the countries engaged in the BCG vaccination program, a simultaneous X-ray examination of the tested group is made. Moreover, the opportunity to evaluate the frequency and type of X-ray changes observed in different geographic areas, in relation to tuberculin sensitivity, will no longer be possible after a mass vaccination of this scope has taken place. It is important, therefore, that such a project should be included in the research plans of the program now. Of particular interest will be the determination of the relationship of the degree of tuberculinization of the population to the type and frequency of abnormal X-ray findings; of the relationship of such findings to the degree of individual sensitization to tuberculoprotein; and, of the frequency of X-ray changes which may simulate tuberculosis occurring among the tuberculin negative groups of the population.

Such comparative studies in different parts of the world would be of unusual value where individual variations in methods of examination and interpretation of results can be avoided. Such uniformity should be preserved in the interpretation of the X-ray films by using one interpreter, or one group of interpreters for films from all areas.

In addition to the uniform standard tuberculin testing prior to vaccination, such a project would entail only the addition of an X-ray examination of each individual tested and arrangements for the proper identification of each film with its respective survey card.

Tuberculosis Mortality Relationships—Age, Race, and Sex, 1947

Age and Tuberculosis Mortality

The recent shift of tuberculosis mortality toward the older age groups has stimulated a great deal of interest in the relationship between age and tuberculosis mortality. Table 1 and the graphs are presented as a convenient means for studying this relationship for the most recent year of available data.

The data have been divided into two groups: one relating to deaths among persons younger than a given age, and the other relating to deaths at a given age and older. The first part of the tabulation presents death rates for these complementary age groups; the second part, proportionate mortality (tuberculosis deaths per 100 deaths

From the Division of Tuberculosis, Public Health Service.

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from all causes); and the third shows the percentage of all tuberculosis deaths falling above or below each given age.

Rates and ratios shown for the groups younger than 100 years and zero years and older are for the United States.

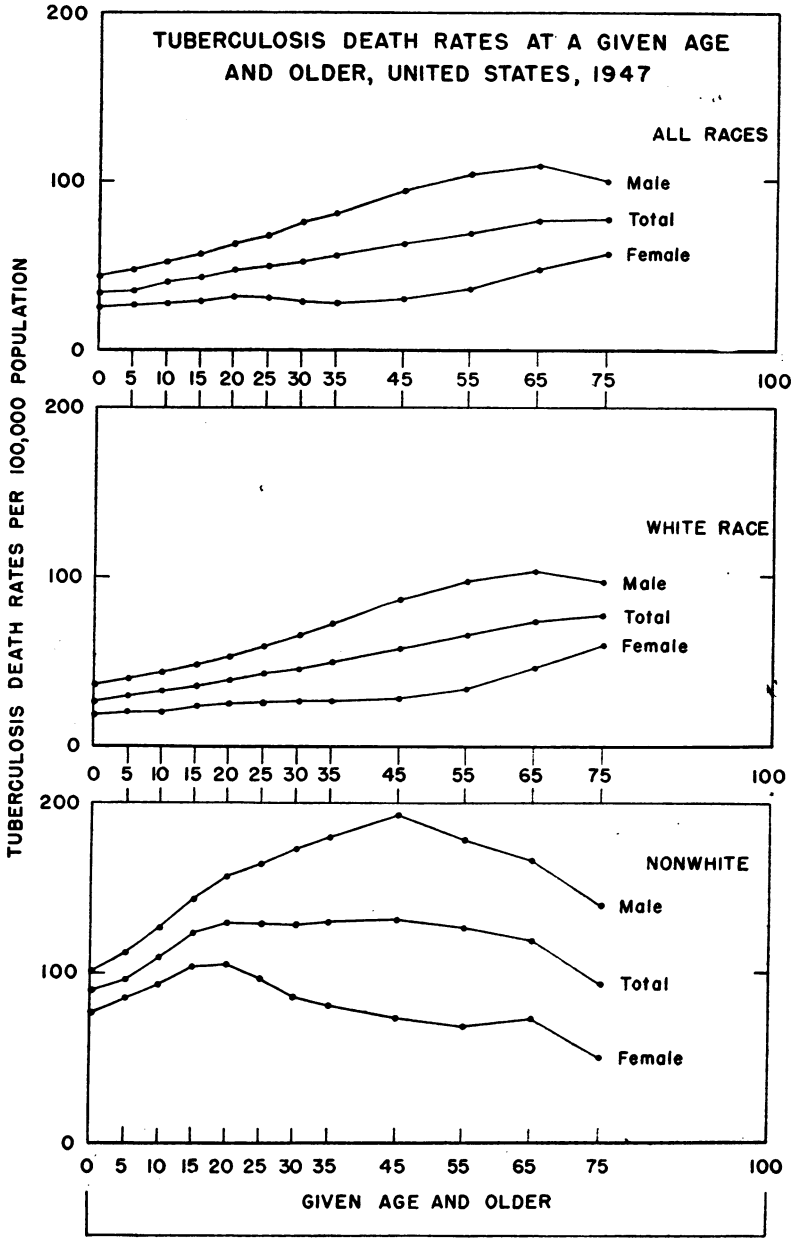

Figure 1.

The bulk of all tuberculosis deaths occur in the older age groups. Thus, 69 percent of the tuberculosis deaths occur at age 35 and over, and 52 percent at age 45 and over.

Note that death rates for those of a given-age-and-older for both the total population and the white race increase as the given age

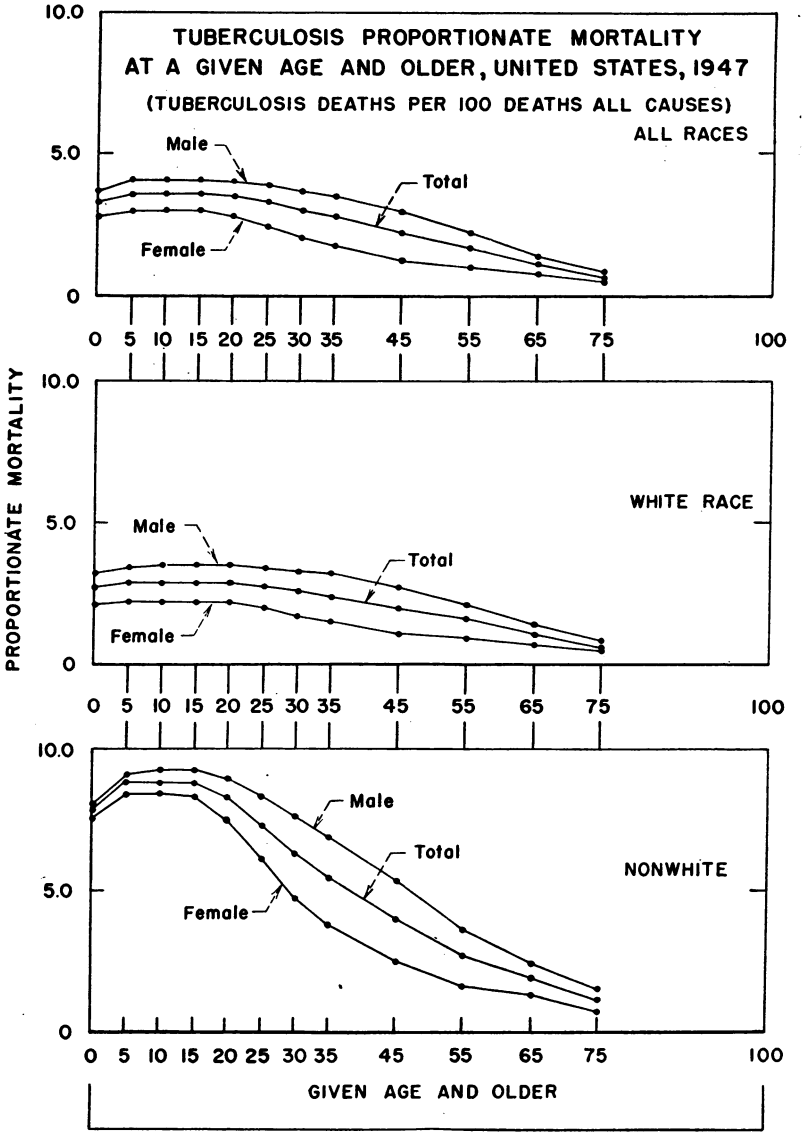

Figure 2.

advances. On the other hand, the rates for nonwhite males show an increase only to the group 45 and older, where a death rate of 190 is reached, after which there is a sharp decline. For nonwhite females, the peak of 105 is reached at age 20 and older and then decreases at later age divisions to a rate below that for all nonwhite females.

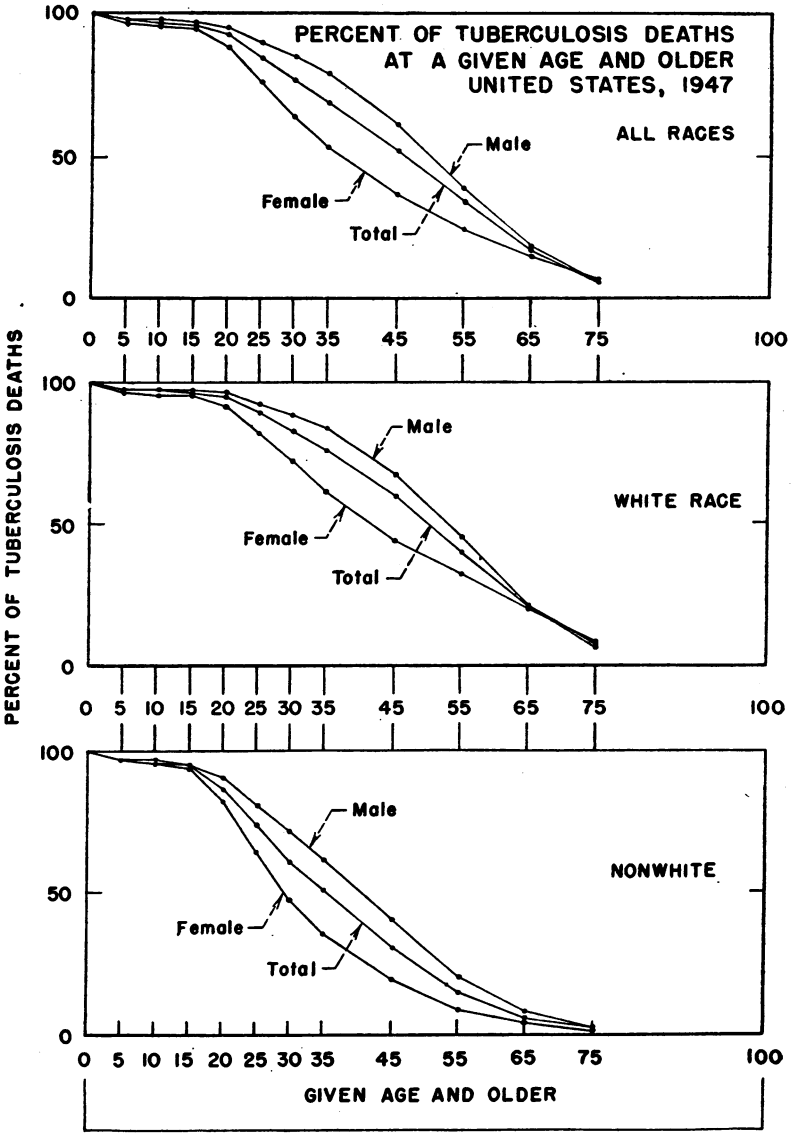

Figure 3.

Table 1. *Tuberculosis All Forms: Selected death rates and ratios by successive complementary age groups for race and sex, United States, 1947*

Given age	All races						White						Nonwhite					
	Total		Male		Female		Total		Male		Female		Total		Male		Female	
	Younger than given age	Given age and older	Younger than given age	Given age and older	Younger than given age	Given age and older	Younger than given age	Given age and older	Younger than given age	Given age and older	Younger than given age	Given age and older	Younger than given age	Given age and older	Younger than given age	Given age and older	Younger than given age	Given age and older
	Tuberculosis death rates per 100,000 population																	
0	------	33.5	------	43.0	------	24.2	------	27.1	------	36.3	------	18.0	------	88.0	------	100.6	------	76.0
5	7.5	36.4	7.8	47.1	7.3	26.0	5.6	29.5	5.7	39.8	5.5	19.3	21.2	96.8	22.9	112.1	19.5	83.3
10	5.0	40.0	5.0	52.0	4.9	28.4	3.6	32.3	3.6	43.8	3.6	21.1	14.1	109.5	14.8	126.2	13.4	93.7
15	4.5	43.7	4.4	57.1	4.7	30.8	3.1	35.3	3.0	48.1	3.1	22.8	14.6	122.2	14.0	142.3	15.2	103.4
20	7.1	46.9	6.0	62.4	8.1	32.1	4.2	38.3	3.7	52.8	4.6	24.3	27.0	129.8	22.2	156.0	31.8	105.4
25	11.7	49.3	9.6	67.8	13.7	31.6	6.7	41.3	5.7	58.3	7.8	24.9	46.4	128.9	37.7	164.2	55.0	96.1
30	15.2	52.0	12.8	73.9	17.6	30.7	9.1	44.6	7.9	64.4	10.3	25.3	59.0	127.8	48.7	173.0	69.0	85.4
35	17.7	55.3	15.7	80.8	19.7	30.3	11.2	48.3	10.1	71.5	12.2	25.6	66.1	129.8	58.0	181.8	73.9	79.9
45	22.3	62.2	23.1	94.2	21.5	30.9	15.3	56.2	16.4	85.8	14.2	27.3	76.3	131.8	75.9	190.8	76.7	73.1
55	26.6	68.9	31.4	103.2	21.9	35.8	19.4	64.8	24.1	97.4	14.8	33.4	83.6	123.9	90.6	177.8	76.9	68.4
65	30.1	76.3	38.0	108.0	22.2	47.3	23.2	73.1	30.9	103.6	15.6	45.5	86.4	119.2	97.1	165.4	76.1	73.2
75	32.5	76.5	41.7	99.8	23.3	56.8	25.9	75.3	34.9	96.7	16.9	57.3	87.9	91.4	99.9	138.9	76.4	50.4
100	33.5	------	43.0	------	24.2	------	27.1	------	36.3	------	18.0	------	88.0	------	100.6	------	76.0	------
	Proportionate mortality (tuberculosis deaths per 100 deaths from all causes)																	
0	------	3.3	------	3.7	------	2.8	------	2.7	------	3.2	------	2.1	------	7.8	------	8.0	------	7.5
5	0.8	3.6	0.7	4.1	0.9	3.0	0.6	2.9	0.6	3.4	0.7	2.2	1.6	8.8	1.5	9.1	1.6	8.4
10	.9	3.6	.8	4.1	1.0	3.0	.7	2.9	.6	3.5	.8	2.2	1.9	8.8	1.8	9.2	2.0	8.4
15	1.1	3.6	.9	4.1	1.3	3.0	.8	2.9	.7	3.5	.9	2.2	2.6	8.8	2.3	9.2	3.0	8.3
20	2.1	3.5	1.5	4.0	2.8	2.8	1.3	2.9	1.0	3.5	1.7	2.2	5.5	8.3	4.1	8.9	7.2	7.5
25	3.8	3.3	2.7	3.9	5.3	2.4	2.3	2.8	1.7	3.4	3.3	2.0	9.7	7.3	7.2	8.3	12.7	6.1
30	5.2	3.0	3.8	3.7	7.2	2.1	3.4	2.6	2.5	3.3	4.8	1.7	12.4	6.3	9.4	7.6	15.9	4.7
35	6.2	2.8	4.8	3.5	8.3	1.8	4.3	2.4	3.3	3.2	5.8	1.5	13.6	5.5	11.0	6.9	16.7	3.8
45	7.2	2.2	6.4	3.0	8.4	1.3	5.5	2.0	5.0	2.7	6.4	1.1	13.6	4.0	12.5	5.3	15.0	2.5
55	6.7	1.7	6.6	2.2	6.8	1.0	5.4	1.6	5.5	2.1	5.3	.9	11.8	2.7	11.6	3.6	11.9	1.6
65	5.5	1.1	5.7	1.4	5.1	.8	4.6	1.1	4.9	1.4	4.0	.7	9.9	1.9	10.1	2.4	9.7	1.3
75	4.3	.6	4.6	.8	3.8	.5	3.6	.6	4.0	.8	3.0	.5	8.7	1.1	8.9	1.5	8.4	.7
100	3.3	------	3.7	------	2.8	------	2.7	------	3.2	------	2.1	------	7.8	------	8.0	------	7.5	------

Table 1. *Tuberculosis All Forms: Selected death rates and ratios by successive complementary age groups for race and sex, United States, 1947*—Con.

Given age	All races						White						Nonwhite					
	Total		Male		Female		Total		Male		Female		Total		Male		Female	
	Younger than given age	Given age and older	Younger than given age	Given age and older	Younger than given age	Given age and older	Younger than given age	Given age and older	Younger than given age	Given age and older	Younger than given age	Given age and older	Younger than given age	Given age and older	Younger than given age	Given age and older	Younger than given age	Given age and older
	Percent of tuberculosis deaths (each race and sex group=100 percent)																	
0	-------	100	-------	100	-------	100	-------	100	-------	100	-------	100	-------	100	-------	100	-------	100
5	2	98	2	98	3	97	2	98	2	98	3	97	3	97	3	97	3	97
10	3	97	2	98	4	96	2	98	2	98	4	96	4	96	3	97	4	96
15	4	96	3	97	5	95	3	97	2	98	4	96	5	95	5	95	6	94
20	7	93	5	95	11	89	5	95	3	97	8	92	13	87	9	91	17	83
25	15	85	10	90	24	76	10	90	7	93	18	82	26	74	19	81	35	65
30	23	77	15	85	36	64	17	83	11	89	28	72	39	61	28	72	52	48
35	31	69	21	79	47	53	24	76	16	84	39	61	49	51	38	62	64	36
45	48	52	39	61	64	36	40	60	32	68	56	44	69	31	59	41	80	20
55	66	34	61	39	76	24	60	40	55	45	68	32	85	15	80	20	91	9
65	83	17	82	18	85	15	79	21	79	21	80	20	94	6	92	8	96	4
75	95	5	95	5	94	6	93	7	94	6	92	8	98	2	98	2	99	1
100	100	-------	100	-------	100	-------	100	-------	100	-------	100	-------	100	-------	100	-------	100	-------

NOTE.—The maximum age of 100 years assumes that no person attains the age of 100 years.

SOURCE: Tuberculosis deaths—Tuberculosis Mortality in the United States, 1947, Pub. Health Rep. 64: 405 (1949). Deaths from all causes—Deaths by Age: United States, 1947, National Office of Vital Statistics, Release FSA-503, January 30, 1949. Population—Current Population Reports, Series P-25, No. 21, Bureau of the Census, Department of Commerce, May 27, 1949, table 2.

Tuberculosis Deaths, Death Rates and Population

This compilation presents (table 2) the number of deaths from tuberculosis (all forms), the tuberculosis death rates, and the corresponding estimated populations from which these rates have been computed, by age, race, and sex for the United States, for 1947. The number of deaths and the estimated population are additive in any combination. Population estimates are rounded to the nearest thousand without adjustment to group totals, which are independently rounded. The rates are not additive. To derive a rate for a population group not explicitly set forth, the deaths and the population for the new grouping must each be summed; then the specific rate is computed by dividing the number of deaths by the population.

Data for tuberculosis deaths by specified race are presented in table 3. Tuberculosis mortality tabulations for race usually group deaths by the categories white and nonwhite. Here, the nonwhite category is shown by the specific races which comprise it, namely, Negro, Chinese, Japanese, Indian, and other. Population estimates for a 7-year postcensal period are speculative, and the accompanying death rates by race should be regarded as subject to possible revision after the 1950 census.

Table 2. *Tuberculosis (all forms) deaths and rates for various age groups by race and sex, with populations, United States, 1947*

Age in years	All races								
	Both sexes			Male			Female		
	Deaths	Rate	Estimated population	Deaths	Rate	Estimated population	Deaths	Rate	Estimated population
Total	48,064	33.5	143,414,000	30,585	43.0	71,140,000	17,479	24.2	72,274,000
0–4	1,099	7.5	14,604,000	579	7.8	7,453,000	520	7.3	7,151,000
5–9	226	1.9	12,110,000	107	1.7	6,174,000	119	2.0	5,937,000
10–14	373	3.5	10,667,000	148	2.7	5,413,000	225	4.3	5,254,000
15–19	1,720	15.6	11,000,000	637	11.7	5,449,000	1,083	19.5	5,551,000
20–24	3,612	30.3	11,919,000	1,440	24.7	5,840,000	2,172	35.7	6,079,000
25–29	3,896	33.3	11,711,000	1,685	29.7	5,674,000	2,211	36.6	6,037,000
30–34	3,801	34.2	11,117,000	1,919	35.6	5,383,000	1,882	32.8	5,735,000
35–44	8,314	41.4	20,082,000	5,338	54.0	9,883,000	2,976	29.2	10,200,000
45–54	8,865	52.8	16,796,000	6,845	81.8	8,368,000	2,020	24.0	8,429,000
55–64	7,999	62.8	12,747,000	6,377	99.4	6,415,000	1,622	25.6	6,332,000
65–74	5,586	76.2	7,335,000	3,971	111.5	3,563,000	1,615	42.8	3,772,000
75 and over	2,544	76.5	3,325,000	1,522	99.8	1,525,000	1,022	56.8	1,800,000
Not stated	29			17			12		
Under 15	1,698	4.5	37,381,000	834	4.4	19,040,000	864	4.7	18,342,000
15–24	5,332	23.3	22,919,000	2,077	18.4	11,289,000	3,255	28.0	11,630,000
25–44	16,011	37.3	42,910,000	8,942	42.7	20,940,000	7,069	32.2	21,972,000
45–64	16,864	57.1	29,543,000	13,222	89.4	14,783,000	3,642	24.7	14,761,000
65 and over	8,130	76.3	10,660,000	5,493	108.0	5,088,000	2,637	47.3	5,572,000
15–34	13,029	28.5	45,747,000	5,681	25.4	22,346,000	7,348	31.4	23,402,000
15–44	21,343	32.4	65,829,000	11,019	34.2	32,229,000	10,324	30.7	33,602,000
15–54	30,208	36.6	82,625,000	17,864	44.0	40,597,000	12,344	29.4	42,031,000
20–34	11,309	32.5	34,747,000	5,044	29.9	16,897,000	6,265	35.1	17,851,000
20–44	19,623	35.8	54,829,000	10,382	38.8	26,780,000	9,241	32.9	28,051,000
25–34	7,697	33.7	22,828,000	3,604	32.6	11,057,000	4,093	34.8	11,772,000
25–54	24,876	41.7	59,706,000	15,787	53.9	29,308,000	9,089	29.9	30,401,000
15 years and over	46,337	43.7	106,032,000	29,734	57.1	52,100,000	16,603	30.8	53,935,000

Table 2. *Tuberculosis (all forms) deaths and rates for various age groups by race and sex, with populations, United States, 1947*—Continued

Age in years	All races								
	Both sexes			Male			Female		
	Deaths	Rate	Estimated population	Deaths	Rate	Estimated population	Deaths	Rate	Estimated population
	White								
Total	34,783	27.1	128,326,000	23,167	36.3	63,764,000	11,616	18.0	64,562,000
0–4	724	5.6	12,836,000	377	5.7	6,569,000	347	5.5	6,267,000
5–9	122	1.2	10,474,000	57	1.1	5,352,000	65	1.3	5,122,000
10–14	150	1.6	9,269,000	63	1.3	4,715,000	87	1.9	4,554,000
15–19	764	7.9	9,661,000	296	6.2	4,793,000	468	9.6	4,868,000
20–24	1,795	17.0	10,572,000	717	13.8	5,185,000	1,078	20.0	5,387,000
25–29	2,209	21.1	10,456,000	988	19.4	5,085,000	1,221	22.7	5,371,000
30–34	2,406	24.2	9,946,000	1,206	24.9	4,842,000	1,200	23.5	5,104,000
35–44	5,778	32.0	18,080,000	3,752	42.0	8,933,000	2,026	22.1	9,147,000
45–54	6,726	44.0	15,271,000	5,314	69.7	7,621,000	1,412	18.5	7,650,000
55–64	6,823	57.7	11,825,000	5,491	92.4	5,942,000	1,332	22.6	5,883,000
65–74	4,947	72.2	6,856,000	3,531	106.5	3,315,000	1,416	40.0	3,541,000
75 and over	2,321	75.3	3,081,000	1,365	96.7	1,412,000	956	57.3	1,669,000
Not stated	18			10			8		
Under 15	996	3.1	32,579,000	497	3.0	16,636,000	499	3.1	15,943,000
15–24	2,559	12.6	20,233,000	1,013	10.2	9,978,000	1,546	15.1	10,255,000
25–44	10,393	27.0	38,482,000	5,946	31.5	18,860,000	4,447	22.7	19,622,000
45–64	13,549	50.0	27,096,000	10,805	79.7	13,563,000	2,744	20.3	13,533,000
65 and over	7,268	73.1	9,937,000	4,896	103.6	4,727,000	2,372	45.5	5,210,000
15–34	7,174	17.7	40,635,000	3,207	16.1	19,905,000	3,967	19.1	20,730,000
15–44	12,952	22.1	58,715,000	6,959	24.1	28,838,000	5,993	20.1	29,877,000
15–54	19,678	26.6	73,986,000	12,273	33.7	36,459,000	7,405	19.7	37,527,000
20–34	6,410	20.7	30,974,000	2,911	19.3	15,112,000	3,499	22.1	15,862,000
20–44	12,188	24.8	49,054,000	6,663	27.7	24,045,000	5,525	22.1	25,009,000
25–34	4,615	22.6	20,402,000	2,194	22.1	9,927,000	2,421	23.1	10,475,000
25–54	17,119	31.8	53,753,000	11,260	42.5	26,481,000	5,859	21.5	27,272,000
15 years and over	33,769	35.3	95,748,000	22,660	48.1	47,128,000	11,109	22.8	48,620,000
	Nonwhite								
Total	13,281	88.0	15,088,000	7,418	100.6	7,376,000	5,863	76.0	7,712,000
0–4	375	21.2	1,769,000	202	22.9	884,000	173	19.5	885,000
5–9	104	6.4	1,635,000	50	6.1	821,000	54	6.6	814,000
10–14	223	16.0	1,398,000	85	12.2	698,000	138	19.7	700,000
15–19	956	71.4	1,340,000	341	51.9	657,000	615	90.0	683,000
20–24	1,817	135.0	1,346,000	723	110.4	655,000	1,094	158.3	691,000
25–29	1,687	134.4	1,254,000	697	118.3	589,000	990	148.9	665,000
30–34	1,395	119.0	1,172,000	713	131.8	541,000	682	108.1	631,000
35–44	2,536	126.6	2,003,000	1,586	166.9	950,000	950	90.2	1,053,000
45–54	2,139	140.3	1,525,000	1,531	205.2	746,000	608	78.0	779,000
55–64	1,176	127.5	922,000	886	187.3	473,000	290	64.6	449,000
65–74	639	133.4	479,000	440	177.4	248,000	199	86.1	231,000
75 and over	223	91.4	244,000	157	138.9	113,000	66	50.4	131,000
Not stated	11			7			4		
Under 15	702	14.6	4,802,000	337	14.0	2,403,000	365	15.2	2,399,000
15–24	2,773	103.2	2,686,000	1,064	81.1	1,312,000	1,709	124.4	1,374,000
25–44	5,618	126.8	4,429,000	2,996	144.0	2,080,000	2,622	111.6	2,349,000
45–64	3,315	135.5	2,447,000	2,417	198.3	1,219,000	898	73.1	1,228,000
65 and over	862	119.2	723,000	597	165.4	361,000	265	73.2	362,000
15–34	5,855	114.5	5,112,000	2,474	101.3	2,442,000	3,381	126.6	2,670,000
15–44	8,391	117.9	7,115,000	4,060	119.7	3,392,000	4,331	116.3	3,723,000
15–54	10,530	121.9	8,640,000	5,591	135.1	4,138,000	4,939	109.7	4,502,000
20–34	4,899	129.9	3,772,000	2,133	119.5	1,785,000	2,766	139.2	1,987,000
20–44	7,435	128.7	5,775,000	3,719	136.0	2,735,000	3,716	122.2	3,040,000
25–34	3,082	127.0	2,426,000	1,410	124.8	1,130,000	1,672	129.0	1,296,000
25–54	7,757	130.3	5,954,000	4,527	160.2	2,826,000	3,230	103.3	3,128,000
15 years and over	12,568	122.2	10,285,000	7,074	142.3	4,972,000	5,494	103.4	5,313,000

SOURCE: Tuberculosis deaths—Tuberculosis Mortality in the United States, 1947, Pub. Health Rep. 64: 405 (1949). Population—Current Population Reports, Series P-25, No. 21, Bureau of the Census, Department of Commerce, May 27, 1949, table 2.

Table 3. *Tuberculosis deaths and death rates by specified race, United States, 1947*

	Total	White	Non-white	Negro	Indian	Chinese	Japanese	All others
Number of tuberculosis deaths:								
All forms	48,064	34,783	13,281	12,271	695	165	92	58
Respiratory system	44,462	32,504	11,958	11,097	574	151	84	52
Other forms	3,602	2,279	1,323	1,174	121	14	8	6
Tuberculosis death rate per 100,000 population:								
All forms	33.5	27.1	88.0	85.1	173.3	191.9	71.9	96.7

SOURCE: Memorandum, National Office of Vital Statistics, Federal Security Agency, May 24, 1949.

Tuberculosis and its Control in Rural Areas

By MILTON I. ROEMER, M.D., M. P. H.*

Historically, tuberculosis has been a predominantly urban disease in the United States. Associated with poverty, congested housing, poor nutrition, and over-exertion, tuberculosis has taken its greatest tolls in the slums of the big city. By the same token, the remarkable decline in the tuberculosis death rate since about 1900 has been due in the main to urban developments. Improvements in housing and nutrition, rises in real wages, isolation and treatment of cases in sanatoria have doubtless all played their part. In the meantime, what has been happening to tuberculosis in rural areas?

It is difficult to give an exact answer. The recording of deaths in the United States before 1937 was solely by place of occurrence. rather than by place of residence. As hospitalization of the tuberculous in sanatoria, usually located in country districts, became more widespread, an increasing proportion of deaths were artifically credited to rural places. Census Bureau definitions of "rural," moreover, have changed over the years, as has the accuracy of death reporting in country districts. Despite these serious limitations of available data, certain general trends in the tuberculosis death rate, as between cities and rural districts, are evident.

Rural and Urban Tuberculosis Death Rates

While tuberculosis mortality has been declining in urban and rural sections alike, it is probable that the decline in the cities has been at a greater rate than in the country. In 1890, when sanatorium deaths were too few to influence the rural-urban comparisons substantially (even though deaths were recorded by place of occurrence), the death

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rate for pulmonary tuberculosis in the cities of registration States was 293 per 100,000, while in the rural parts of these States (defined then as places of under 8,000 inhabitants) it was 181 per 100,000 (*1*). Skipping over the years in which statistical comparisons of data recorded by place of occurrence become more difficult to interpret because of increased recording of deaths in rural sanatoria, and coming to 1940 when deaths were recorded by place of residence,[1] the death rates were as follows: 54.6 per 100,000 in cities of 100,000 population and over; 42.4 in cities of 10,000 to 100,000; 47.7 in towns of 2,500 to 10,000; and 41.3 in rural areas (defined as places of less than 2,500 and open country) (*2*). Thus, from an urban death rate 62 percent higher than the rural rate in 1890, the differential fell to a total urban rate (49.4 per 100,000) only about 20 percent higher than the rural rate in 1940.

Accurate urban and rural tuberculosis death rates cannot be determined for any year since 1940, because accurate rural-urban population data are not available. On the basis of intercensal estimates of population, however, rough rates can be computed. Thus, in 1946, there were 31,804 tuberculosis deaths reported for urban places, and 19,107 for rural areas (*3*). In that year, the Census Bureau estimated the urban civilian population at about 82,149,000 and the rural, about 54,818,000 (*4*). Accordingly, the approximate urban tuberculosis death rate in 1946 was 38.7 per 100,000 and the rural rate 34.9. It may be noted that this represents a continued decline of the urban rate at a more rapid pace than the rural rate, with the urban rate only 9.8 percent higher than the rural in 1946.

Even in 1940, the rural tuberculosis death rate was higher than the urban in certain demographic groups. The most striking relationship was evident in death rates for white females, with the rural death rate actually higher than the urban at all ages from 15 years up. The total age-standardized death rate for tuberculosis among rural white females in 1940 was 30.9 per 100,000 compared with 26.1 for urban white females. Among nonwhite females, the rural death rate exceeded the urban at ages above 54 years. Among white males the rural death rate exceeded the urban at ages above 74 years; and among nonwhite males, at ages above 84 years (*5*).

These demographic findings may, in a sense, foreshadow over-all future trends, for they illustrate what happens to the tuberculosis death rate in sex and age groups least subject to frequent epidemiologic contacts. Of the various demographic groups, surely white women

[1] Even the current practice entails some error since residence is defined as the usual place of residence unless the decedent has resided elsewhere for 1 year or longer prior to death; thus, if an urban patient with tuberculosis is hospitalized in a rural sanatorium for more than a year before death, the death is recorded for the rural location. In recent years, however, there has been increasing emphasis upon the construction of sanatoria in urban centers and surgical developments have shortened the average duration of hospitalization, so that the over-all effect of this recording practice is now probably not great.

are the most favored with respect to contact with the general population. Aged persons of the other sex-race groups are likewise of relatively low mobility among the general population, so that contact is also most likely to be minimal. In the demographic groups with fewest epidemiologic contacts, in other words, the rural death rate from tuberculosis is already higher than the urban. Case finding and isolation of active cases from a community achieve the same effect as reduction of epidemiologic contacts. As these steps are increasingly taken in the cities, therefore, we may expect the curves for urban and rural tuberculosis death rates ultimately to cross, with urban rates becoming lower than rural for all age-sex-racial groups.

Rural Life and Tuberculosis

The task of controlling tuberculosis in rural America is made difficult by all the factors that impede the provision of general public health and medical services. Low per-capita income and low population density, with concomitant deficiencies of medical personnel, facilities, and health agencies, create handicaps in the battle against tuberculosis and, for that matter, most other diseases.

Rural poverty has its effects on the problem of tuberculosis, as does the squalor of city slums. The central fact that characterizes the approximately 55,000,000 Americans living in rural areas, as compared with city-dwellers, is their lower average family incomes, even taking full account of the value of home produced and consumed food and fuel. Despite unprecedented farm prosperity, the net per-capita income of persons living on farms (including income from nonfarm employment and the value of home produced and consumed goods) in 1945 was $743, compared with $1,259 for the nonfarm population (*6*). While about 40 percent of the rural population is not engaged in agriculture, rural nonfarm income levels are closer to those of the farm population than to those of the urban population. There are, of course, vast differences among the rural regions of the Nation—especially between the heavily populated rural South and the sparsely settled Great Plains—but the general standard of living, with all its relationships to the basic etiology of tuberculosis, is substantially lower in rural areas of the Nation as a whole than in the cities.

All the elements entering into a standard of living, with their rural and urban levels, cannot be analyzed here. To cite only the most obvious—education, housing, nutrition and the use of labor-saving devices—is to reveal the basic distinction. It is generally recognized that rural educational levels (and this includes education on personal hygiene and living habits) are woefully below the urban. Furthermore, it may not be so widely recognized that average rural housing is actually more congested than urban, with 6 percent of urban dwell-

ings classified by the Census Bureau as seriously overcrowded in 1940, compared with 11 percent of rural nonfarm homes and 16 percent of farmhouses (*7*). It must be recalled that rural families are larger than urban and that acres of land around a home do not add an inch of space to the rooms in which the family eats, sleeps, and lives.

The comparative level of urban and rural nutrition is difficult to evaluate. There is some evidence that in generally poor economic periods, like the depression of the 1930's, the level of rural nutrition is slightly better than urban, though much less so than one might expect among families of the soil (*8*). In more prosperous periods, urban eating habits improve enormously and it is quite likely that they exceed rural levels of achievement of the ideally balanced diet. As for the use of labor-saving machinery, any marketer of washing machines, vacuum cleaners, or automobiles will testify to the higher utilization of consumer-durable goods among city families.

The relevance of all this to the problem of tuberculosis would seem to be simply this: if tuberculosis is the classical "social disease" (*9*), the socio-environmental factors contributing to its occurrence are today found most strikingly in rural parts of the United States, with one important exception, epidemiologic contacts. Those are obviously much more frequent in industrialized urban centers. It is probably safe to say that, except for the increased opportunity for the person-to-person spread of tubercle bacilli in the cities, the conditions of rural life in America today provide the basis for a higher tuberculosis mortality than do those of urban life. When we select demographic groups in which social contacts are relatively fewer, as we have done above, this fact emerges sharply.

There is little evidence for the assumption of some that urban men experience higher tuberculosis death rates than rural men because industrial labor involves greater physical exertion than other forms of labor (*5*). Few farmers or farm laborers who work from dawn to dusk would agree with this, as would few miners, fishermen, or lumbermen, the vast majority of whom are country dwellers. Likewise, little agreement would be found among the growing ranks of employees of small-town and village industries which, being less fully unionized and less competitive for a supply of labor, offer generally inferior working conditions than urban factories. There is one predominantly rural occupation in which tuberculosis is a special hazard. About 73 percent of the Nation's miners are country dwellers, and the hazard of silicosis with associated tuberculosis is well recognized among them. Coal miners with silicosis constitute a major problem in the tuberculosis control program of the rural counties in West Virginia.

Measures for Urban and Rural Tuberculosis Control

As efforts are increased in the cities to reduce the chances of epidemiologic contact with unrecognized cases of tuberculosis, we may expect, as suggested above, that in time the urban prevalence of the disease in both sexes and all races will decline below that for rural areas. The prinicpal measures which are being employed are case finding and isolation—the former through the general services of private physicians, public health tuberculosis clinics, mass X-ray surveys, and related practices; the latter through hospitalization in sanatoria. If the rural burden of tuberculosis is to be reduced at a rate commensurate with urban improvement, comparable measures of medical and public health control will be necessary.

To face this challenge calls for action in every aspect of national health planning. The services of physicians must be made available to rural people through a comprehensive national approach. An increase in total output of medical personnel is needed, combined with measures to attract them to rural practice. It is widely recognized that this requires assurance of adequate purchasing power for physicians' services and provision of regionalized plans of modern hospital and laboratory facilities. The National Hospital Survey and Construction Act, as passed by Congress in August 1946, falls far short of achieving the latter end, exactly as champions of rural health service had predicted. Little inducement for undertaking needed construction is offered to low-income rural communities when the Federal Government provides funds for only one-third of the cost. In West Virginia, for example, two and a half years after passage of the law, not a single new rural hospital or health center has yet been constructed under this program. All this has its ultimate effects in handicapping the rural attack on tuberculosis.

Aside from the diagnosis of tuberculosis through the acumen of private physicians (made more difficult by the lack of X-ray and laboratory equipment in rural practice), the major methods of case finding are, of course, through the efforts of public health agencies. The over-all deficiencies of public health coverage in rural areas are too well recognized to require recitation here (*10*). In terms of tuberculosis control, they mean fewer public health nurses for epidemiologic work-up of cases and contacts in the home, fewer tuberculosis clinics for examination of suspects, contacts, or the general population, and far fewer facilities and equipment for mass chest X-ray surveys (*11*). It is rare that an urban health department lacks a chest clinic, but commonplace for a rural public health agency to have no significant provision for tuberculosis control in its total program. Deficiencies

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NOTE. For a fuller discussion of rural health service facilities, see Rural Health and Medical Care, by Mott and Roemer (*8*).

in rural environmental sanitation have their special effects on tuberculosis by allowing the continued, albeit slight, occurrence of bovine-type tuberculosis in rural districts through the consumption of unpasteurized milk.

The sweeping case-finding accomplishments of community-wide mass chest X-ray surveys are being enjoyed mainly by the residents of large and medium-sized cities. Naturally, measures of this type will be employed where the yield of detected cases per dollar spent will be greatest and, at present, this will nearly always be higher in the larger cities. Even in relatively rural counties, when mobile chest X-ray units from a State health department arrive, the population surveyed will be mainly the residents of the county seat or other urban center in the county. In Monongalia County, West Virginia, for example, a recent chest X-ray survey by a mobile unit screened 1,100 persons per day in a 4-day stand at the county seat (Morgantown), but only 300 per day when the unit stopped at a rural village (Blacksville) in the center of the county's principal farming section; yet, equal efforts were put forth to bring in people at both places. It is simply harder to reach scattered rural people with any social or technical service. They can only be reached if public agencies are willing to spend more money per person served.

Where public health agencies are weak, there are often voluntary health agencies to fill the gap. But even this is most generally true in urban centers. Tuberculosis and health associations—probably the Nation's most well-established voluntary health agencies—are strongest in the larger cities. It is true that in many rural counties virtually the only tuberculosis control program in operation is that promoted from the proceeds of local Christmas seal sales. But in hundreds of rural counties, both with and without official health agencies, there is no active tuberculosis association at all.

There are further ways in which tuberculosis case-finding efforts in rural sections fall short of urban practice. A chest X-ray, as a pre-employment routine, is becoming increasingly common in the large plants of the Nation's industrial centers, but is rare in small-town industry. School teachers are often systematically checked for tuberculosis in the larger cities but rarely in rural counties. The school board in Monongalia County declined to make an annual chest X-ray mandatory for the 450 school teachers in the county, although the year before a teacher of a one-room school was found to have a case of moderately advanced pulmonary tuberculosis. In large-city hospitals, a routine chest X-ray of all patients on admission is coming to be an accepted procedure, but only a handful of rural hospitals are doing this. The cost-per-patient tends to be too high to justify the installation of photofluorographic equipment in hospitals of under

100 beds, and most rural institutions are below this capacity. A hospital of 125 beds in Monongalia County installed such equipment only because it was purchased by the West Virginia State Department of Health. Not one of the other 54 counties of this predominantly rural State has such facilities, however.

Once cases of tuberculosis are found, facilities for their care are far less adequate in rural sections than in urban areas. The conventional method of evaluating the adequacy of tuberculosis sanatorium facilities—in terms of beds per annual death—takes account of the lesser need in those rural States which today may have a relatively lower prevalence of the disease. Yet, even by this measure, the States with 50 percent or more urban population have about twice the supply of tuberculosis beds, relative to the extent of their problem, as the predominantly rural States. In States with less than 30 percent rural population there were, in 1942, 2.0 beds per annual tuberculosis death; States with 30–39 percent rural population had 1.7 beds per death; States 40–49 percent rural had 1.6 beds per death; States 50–59 percent rural had 1.1 beds; States 60–69 percent rural had 0.7 beds; and States 70 percent or more rural had 0.9 beds per annual death (*12*). There is nothing to indicate any appreciable change in this relative picture since 1942. These figures actually understate the true rural-urban differential in facilities, since many of the beds in both the urban and rural States are in city- or county-owned (rather than State) institutions which admit only residents of the local political unit, and it is seldom indeed that a rural county can afford a sanatorium of its own. The Negro population, which is predominantly rural, is especially undersupplied as far as sanatorium facilities are concerned.

The shortage of sanatorium beds in rural States has obvious implications for the control of tuberculosis in rural areas. Typically, there is a waiting list of patients seeking admission. This means that active cases of tuberculosis remain in the community for months, or permanently, rather than in isolation. If they are kept in bed at home, it is the rare rural home that can provide proper protection for the rest of the family—a family usually larger than its urban counterpart.

The spread of the disease is further aggravated by the policy of sanatoria in many rural States to give admission preference to early cases—cases with a good prospect for recovery. In West Virginia, for example, a patient must be able to "walk in" to be admitted to one of the three State institutions. Other rural States specifically bar far-advanced cases. Such policies, growing from a desperate effort to accommodate to a shortage of beds, leave the most highly infectious cases in the farmhouse or village.

With insufficient funds appropriated to operate the sanatoria in most rural States, they are often unpleasant places in which to spend months of time, and many patients offered a bed refuse to go. Compulsory hospitalization of infectious tuberculosis may be possible under law; but the average health officer hesitates to invoke such authority, and the bed will be taken by a perhaps less needy case. Poor sanatorium conditions, moreover, yield a high rate of departures against medical advice so that infectious cases often return to their rural homes free to spread the disease again.

A means test for free hospitalization, finally, is still retained in most rural States, impeding the admission of patients not willing to pay a part of their maintenance. In West Virginia, persons not certified as medically indigent long had to pay $1 per day for their care. The concerted action of citizens' groups and public health workers recently succeeded in eliminating this requirement, and in making sanatorium care completely tax-supported as of July 1949.

Other aspects of rural community organization have a bearing on the total problem of tuberculosis control. Rural welfare programs are notably weaker than urban, so that public assistance to the family, whose breadwinner or homemaker has been disabled by tuberculosis (either in a sanatorium or bedridden at home), is less adequate. This is true of the Federal-State aid to dependent children program, as well as the State-local programs of general relief. Voluntary relief agencies often supplement public assistance substantially in the larger cities, but the aid they can offer in rural communities is usually meager. This huge problem of family dependency often leads the husband or wife to resist hospitalization until the disease makes them collapse.

In a few States—Rhode Island, California, New York, New Jersey, and Washington—compulsory disability insurance laws have been passed which provide some financial assistance to workers disabled with tuberculosis (or other diseases) up to 26 weeks a year, and there is a likelihood that such legislation will be enacted in other States (*13*). Since these social insurance programs are tied to the unemployment compensation systems, however, they do not cover agricultural employment and so offer few benefits in rural areas.

The pattern of American agriculture, involving large seasonal migrations at harvest time, creates a special tuberculosis problem among migratory farm workers. At the very bottom of the rural economic ladder, migrants have an especially high rate of tuberculosis. Yet, lacking residence in the places where they work many months of the year, hospitalization is often not available to them, and the infection may be carried from State to State even after a diagnosis has been made (*14*).

The Rural Challenge

As living conditions improve, and effective case finding, treatment, and isolation of cases continue to reduce the prevalence of tuberculosis in the cities of the Nation, we will ultimately be faced with the task of final eradication of the disease in the rural areas. The very reduction of the urban prevalence, it is true, will have its indirect effects in reducing the rural prevalence simply because much of the disease in country-dwellers is contracted during visits to the cities. But present trends point to the time when tuberculosis may become the predominantly rural problem that typhoid fever, once an urban scourge, has become in the last 30 or 40 years.

Despite the difficulties of applying medical and public health measures in rural areas, the lesser epidemiologic contacts of country-dwellers remain a distinct advantage in the fight on the disease in rural areas. While it may be harder to find cases among rural people and, once found, harder to get them isolated and treated, the channels of person-to-person spread are, on the whole, fewer. In this sense, an active attack on the disease in rural sections can be highly rewarding and, coupled with vigorous efforts in the cities, can actually bring us to the goal of complete eradication.

Despite the trend of urban and rural death-rate curves, the lowest State-wide tuberculosis death rates are in predominantly rural areas. In 1947, death rates of 20 per 100,000 or lower were achieved in Idaho, Iowa, Kansas, Minnesota, Nebraska, New Hampshire, North Dakota, Utah, Wisconsin, and Wyoming (*15*).

The attack on rural tuberculosis can hardly be effective except as it is launched on all the fronts of rural health service. Rural housing, education, nutrition, and general living standards must be elevated. The services of competent physicians—specialists as well as general practitioners—must be made available for the everyday care and prevention of illness. General hospitals and tuberculosis sanatoria must be expanded commensurate with need. Public health agencies must be extended to cover every country-dweller, and X-ray services for periodic chest check-ups must be made generally accessible. Social measures to provide for the families of persons disabled with tuberculosis must be provided.

Unless these steps are taken, we may expect a permanent reservoir of tuberculosis to smolder indefinitely in rural districts. With these steps taken in city and country alike, tuberculosis can be eradicated from America.

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INCIDENCE 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 SEPTEMBER 17, 1949

A decline less sharp than during the preceding week was recorded in the reported incidence of poliomyelitis—from a total of 2,701 cases last week to 2,624 currently. The 5-year (1944–48) median is 1,440. For the corresponding week last year the total was 1,839, representing an increase of 313 cases. Currently, decreases were recorded in the 6 Central, South Atlantic, and Mountain divisions, but in the New England, Middle Atlantic, and Pacific areas, increases of 32, 27, and 21 cases, respectively, were reported. An aggregate increase of 216 cases was recorded in 23 States, none showing an increase of more than 22 cases.

The 30 States reporting currently more than 18 cases each are as follows (last week's figures in parentheses): *Increases*—Maine 50 (47), Massachusetts 165 (145), Connecticut 56 (43), New York 354 (336), New Jersey 127 (105), Illinois 196 (191), Michigan 208 (195), Minnesota 150 (128), North Dakota 35 (23), Kansas 51 (47), Virginia 26 (21), Louisiana 22 (6), Washington 39 (34), Oregon 27 (17), California 127 (121); *decreases*—Pennsylvania 64 (77), Ohio 146 (178), Wisconsin 64 (82), Iowa 64 (75), Missouri 60 (75), South Dakota 23 (44), Nebraska 46 (60), Kentucky 32 (41), Tennessee 27 (32), Arkansas 25 (34), Oklahoma 50 (86), Texas 52 (65), Idaho 21 (28), Colorado 54 (77); *no change*—Indiana 68. The total for the year to date is 29,091, as compared with 16,022 for the corresponding period last year and a 5-year median of 12,412.

Of the total of 31 cases of infectious encephalitis reported, in 12 States, only 2 States reported more than 2 cases each—North Dakota 10 (last week 6), and Colorado 9 (last week 10). Two cases of anthrax were reported during the week, 1 each in New York and Ohio, and 2 cases of leprosy, 1 each in California and Minnesota.

A total of 8,508 deaths was recorded during the week in 94 large cities in the United States, as compared with 7,831 last week, 8,208 and 8,312, respectively, for the corresponding weeks of 1948 and 1947, and a 3-year (1946–48) median of 8,267. For the year to date the total is 340,683, as compared with 343,384 for the same period last year. Infant deaths for the week totaled 640, last week 552, same week last year 609, 3-year median 701. The cumulative figure is 24,148, same period last year, 24,797.

Telegraphic case reports from State health officers for week ended September 17, 1949

[Leaders indicate that no cases were reported]

Division and State	Diphtheria	Encephalitis, infectious	Influenza	Measles	Meningitis, meningococcal	Pneumonia	Poliomyelitis	Rocky Mt. spotted fever	Scarlet fever	Smallpox	Tularemia	Typhoid and paratyphoid fever [a]	Whooping cough	Rabies in animals
NEW ENGLAND														
Maine				1			50		1				3	
New Hampshire							16							
Vermont				2			12		3				7	
Massachusetts	3	1		12			165		11				112	
Rhode Island				3		2	17						5	
Connecticut				2		27	56						38	
MIDDLE ATLANTIC														
New York	3	1	[c]	43	2	156	354		[d] 22			3	199	15
New Jersey		1	2	35	3	35	127		5			2	131	
Pennsylvania	3		[c]	15	5	52	64	1	14			8	131	1
EAST NORTH CENTRAL														
Ohio	2			10	1	26	146		33		2	1	67	8
Indiana	10	2		7		3	68	1	11				13	9
Illinois	2	2		21	3	57	196		19		1	3	88	
Michigan [b]	2		3	26	2	30	208		34				95	6
Wisconsin				35	2	6	64		8			2	75	
WEST NORTH CENTRAL														
Minnesota				1	2	4	150		12			1	3	1
Iowa				2			64		5			1	6	4
Missouri	2	1	2			1	60		1		1	1	11	
North Dakota		10		1	1		35		3				1	
South Dakota		1			1		23		1					
Nebraska	2		5	1			46		11			1		
Kansas			3			2	51		2			1	4	
SOUTH ATLANTIC														
Delaware				1			3					1	1	
Maryland [b]	1		2	4		18	[f] 3		4			3	34	
District of Columbia	2			2		16	8							
Virginia	3		121	5	4	16	26	4	11			5	14	1
West Virginia	5		2	3	1	1	18		10			5	20	
North Carolina	18			3	4		10	1	34		4	1	23	
South Carolina	10		7	4	1	15	9	1	6			5	2	2
Georgia	20		3	1	2	9	8	1	9			4	2	9
Florida	3	1	6	6		9	14		3		1	1	5	2

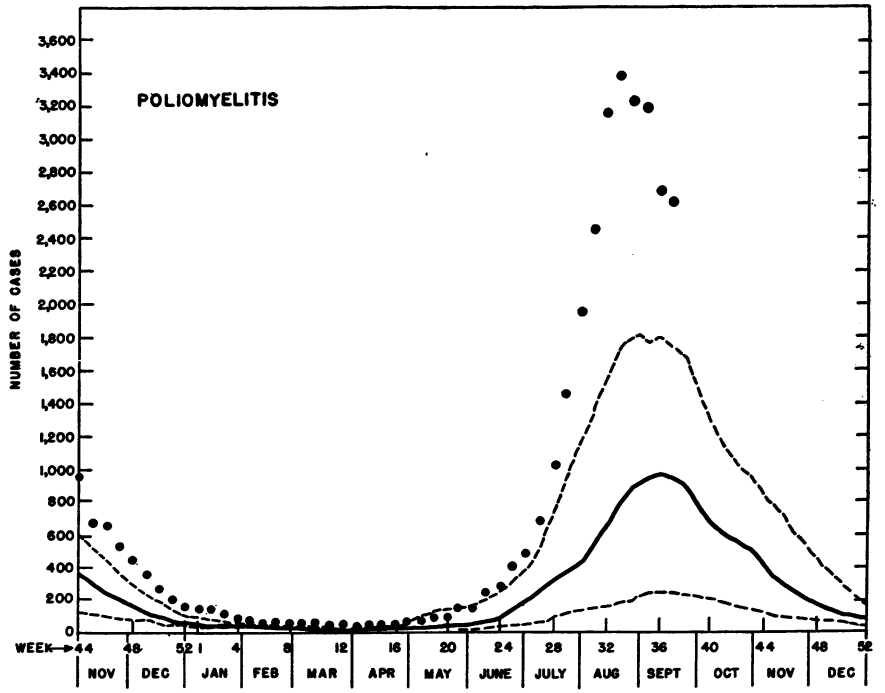
EAST SOUTH CENTRAL														
Kentucky	9			6		15	32		17			8	12	7
Tennessee			3	2	5	19	27		31			13	12	
Alabama	14		7	1	1	22	17		8			2	2	7
Mississippi [a]	9			3		11	11		7			1	3	
WEST SOUTH CENTRAL														
Arkansas	6		9	4		5	25		3		3	2	3	
Louisiana	2				1	19	22		5			6		
Oklahoma	5	1	10	1		15	50	1	2				3	2
Texas	22		422	31	3	149	52		7		1	9	73	11
MOUNTAIN														
Montana	3		2	4		5	7					1	3	
Idaho			6	5		1	21		[d] 20				1	
Wyoming				3		4	7							
Colorado		9	15	2		14	54		5			1	7	
New Mexico				2		8	16		4			3		
Arizona			17	9		6	1		1			1	12	
Utah [a]	1			11		1	18		3		3		8	
Nevada														
PACIFIC														
Washington				10			39		11		2		6	
Oregon			3	19		10	27		3				8	
California	3	1	8	55	2	33	127		[d] 17			9	121	5
Total	165	31	658	414	46	822	2,624	10	417		18	105	1,364	
Median, 1944–48	273	17	623	535	50		1,440	11	751	2	14	146	2,185	
Year to date, 37 weeks	4,897	510	79,863	589,431	2,516	58,861	[1] 29,091	510	59,627	42	887	2,707	43,704	
Median, 1944–48	7,752 (27th)	423	194,096 (30th)	552,938 (35th)	4,666 (37th)		12,412 (11th)	473	89,227 (32nd)	277 (35th)	684	3,000 (11th)	72,285 (39th)	
Seasonal low week ends	July 9		July 30	Sept. 3	Sept. 18		Mar. 19		Aug. 13	Sept. 3		Mar. 19	Oct. 2	
Since seasonal low week	1,129		3,996	913	3,360		[1] 28,175		1,367	1		2,247	53,737	
Median, 1944–45 to 1948–49 [b]	2,036		3,899	1,030	6,170		12,149		2,932	4		2,525	98,906	

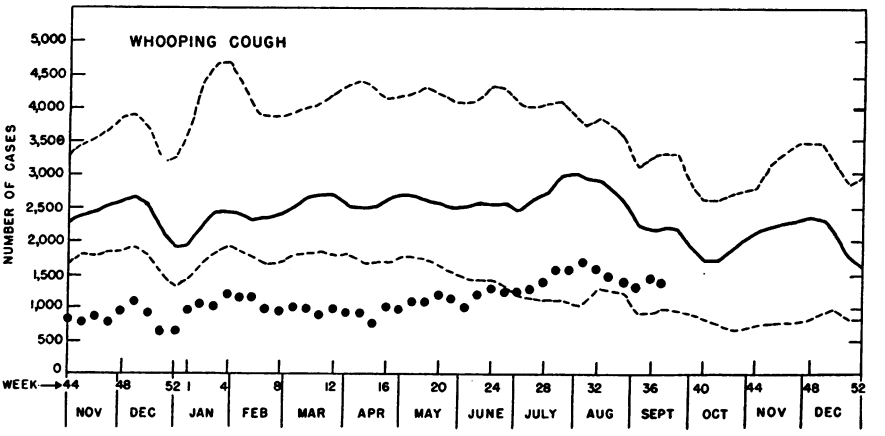
[a] Period ended earlier than Saturday.
[b] The median of the 5 preceding corresponding periods; for meningitis and whooping cough, the corresponding periods are 1943–44 to 1947–48.
[c] New York City and Philadelphia only, respectively.
[d] Including cases reported as streptococcal infection and septic sore throat.
[e] Including paratyphoid fever; currently reported separately as follows: Wisconsin 2, Iowa 1, Virginia 2, South Carolina 1, Georgia 3, Kentucky 1, Louisiana 2, Texas 3, California 2. Cases reported as Salmonella infection not included in the table, were as follows: Massachusetts 2, New York 1.
[1] Poliomyelitis: Delayed reports, Maryland, July onset 4 cases, August onset 6 cases.

Anthrax: New York 1 case, Ohio 1 case.
Leprosy: California, 1 case; Minnesota 1 case (out of state).
Alaska: No cases reported of the diseases included in the table.
Hawaii Territory: Measles 24, lobar pneumonia 2.

Communicable Disease Charts

All reporting States, November 1948 through September 17, 1949





The upper and lower broken lines represent the highest and lowest figures recorded for the corresponding weeks in the 7 preceding years. The solid line is a median figure for the 7 preceding years. All three lines have been smoothed by a 3-week moving average. The dots represent numbers of cases reported for the weeks of 1949.

PLAGUE INFECTION IN PARK COUNTY, COLO.

Under date of Sept. 19, plague infection was reported proved in a pool of 22 fleas obtained on Sept. 1 by flagging burrows of prairie dogs, *Cynomys gunnisoni*, at a location 1½ miles south, thence 2½ miles southwest of Fairplay, Park County, Colo.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague in fleas.—On September 8, 1949, plague infection was reported proved in a mass inoculation of 49 fleas taken from 82 rats trapped August 24, 1949, in District 2A, Kukuihaele, Hamakua District, Island of Hawaii, T. H.

FOREIGN REPORTS

CANADA

Provinces—Notifiable diseases—Week ended August 27, 1949.—During the week ended August 27, 1949, cases of certain notifiable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox			1	2	19	25	5	17	25	26	120
Diphtheria	2		1		8						11
Dysentery, bacillary					1			1			2
Encephalitis, infectious							1	2			3
Influenza							11	1			12
German measles			2		1	7	2	2	6	2	22
Measles			3	1	47	24	8	68	19	101	271
Meningitis, meningococcal			1				1				2
Mumps			15		9	42	6	6	9	23	110
Poliomyelitis	5		1	3	72	110	9	10	11	23	244
Scarlet fever			2		6	13	3		6	2	32
Tuberculosis (all forms)	34		8	9	139	16	58	17	59	40	380
Typhoid and paratyphoid fever				1	6	2		1	2		12
Undulant fever					3	2			2		7
Venereal diseases:											
Gonorrhea	14		21	7	98	86	39	17	42	63	387
Syphilis	3		9	5	43	25	4	3	5	13	110
Whooping cough					110	32	1	4	1	4	152

FINLAND

Notifiable diseases—July 1949.—During the month of July 1949, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	10	Paratyphoid fever	140
Diphtheria	76	Poliomyelitis	10
Dysentery	6	Scarlet fever	148
Gonorrhea	686	Syphilis	60
Lymphogranuloma inquinale	1	Typhoid fever	14
Malaria	4		

NEW ZEALAND

Notifiable diseases—5 weeks ended July 30, 1949.—During the 5 weeks ended July 30, 1949, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	10	1	Ophthalmia neonatorum	2	
Diphtheria	24		Poliomyelitis	13	1
Dysentery:			Puerperal fever	2	
Amebic	5		Scarlet fever	95	
Bacillary	62		Tetanus	2	
Encephalitis, lethargic	1		Trachoma	3	
Erysipelas	19		Tuberculosis (all forms)	202	59
Food poisoning	1		Typhoid fever	5	
Lead poisoning	1		Undulant fever	1	
Malaria	2				

POLIOMYELITIS IN FOREIGN COUNTRIES

The following information is taken from copies of the Weekly Epidemiological Record dated September 7 and 14, issued by the World Health Organization:

Australia.—Second quarter of 1949, 200 cases (of which 142 in Melbourne).[1]

Canada.—July 31–August 13, 380 cases (of which 125 in Ontario Province and 61 in Quebec Province).[2]

Denmark.—No epidemic incidence reported.

England and Wales.—First 34 weeks of 1949, 2,741 cases; week ended August 20, 295 cases; week ended August 26, 280 cases; week ended September 3, 308 cases (of which 43 in London).

France.—January–June, 1949, 151 cases; July, 153 cases; August, 304 cases. Widespread geographical distribution reported; small foci in the following Departments: Bouches-du-Rhône, Saône-et-Loire, Seine-et-Oise, and recently Creuse, Rhone, and Seine.

[1] Later report shows 418 cases with 27 deaths in the State of Victoria from January 1 to August 31 (32 cases same period last year). A large number of current cases stated to be in adults. (See Pub. Health Rep. Sept. 30, 1949, p. 1240).

[2] Later information reports 277 cases in Ontario Province from January 1 to August 8 (97 same period last year), of which 172 cases were in Toronto (69 residents, 103 nonresidents; 12 deaths in nonresidents. See Pub. Health Rep. Sept. 9, 1949, p. 1166). Mortality stated to be about 6 percent.

Germany.—British Zone: Week ended September 10, 38 cases, with 1 death. *French Zone:* From the first of the year to August 20, 46 cases with 4 deaths, distributed as follows: Baden, 14 cases; Wurttemburg, 25 cases, 3 deaths; Land Rheno-Palatin, 7 cases, 1 death. *U. S. Zone:* Incidence not above seasonal limits; 45 cases, 6 deaths, in August, of which 35 cases and 5 deaths were in one district. *Berlin:* Week ended September 3, 1 case in the British Sector, 3 cases in the French Sector, and 34 cases, 2 deaths, in the U. S. Sector.

Greece.—Only 11 sporadic cases during the first 7 months of 1949.

India.—During first 8 months of 1949: *Bombay*—289 cases, with 49 deaths; *Calcutta*—Average of 1 case per day; *Delhi*—6 cases in August.

Italy.—January 1–August 31, 1949, 1,590 cases, as compared with 1,606 cases for the corresponding period last year.

Luxemburg.—One isolated case.

Mexico.—August 16–20, 16 cases in Mexico City.

New Zealand.—304 cases during the first quarter of 1949 and 77 cases during the second quarter, but few cases during July and August.

Poland.—47 cases during first 6 months of 1949, as compared with 80 cases for the same period last year.

Scotland.—First 34 weeks of 1949, 173 cases.

Sweden.—January–July and second half of August, 1949, 250 cases.

Yugoslavia.—Situation about the same as in previous years. From January to August 14, 1949, 84 cases, with 14 deaths.

Other Countries.—Indo-china, Kenya, Mauritius, Mozambique, Nyasaland, Tanganyika, and Union of South Africa only a few sporadic cases reported in June. Ceylon, Federated Malay States, Manila, Sarawak, and Singapore only a few sporadic cases reported during July and August, 1949.

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

Note.—The following reports include only items of unusual incidence or of special interest and the occurrence of these diseases, except yellow fever, in localities which had not recently reported cases. 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 in each month.

Plague

Belgian Congo—Stanleyville Province.—On September 3, 1949, 1 fatal case of plague was reported in the village of Bi, southwest of Blukwa, Stanleyville Province, Belgian Congo.

Ecuador—Loja Province.—During the period August 1–15, 1949, 1 case of plague was reported in Balsas, Paltas County, Chaguarpamba District, Loja Province, Ecuador.

Netherlands Indies—Java—Jogjakarta.—During the week ended September 10, 1949, 2 cases of plague were reported in Jogjakarta, Java.

Peru—Lambayeque, Lima, and Piura Departments.—Plague has been reported in Peru as follows: In Lambayeque Department, Chiclayo Province, June 1–30, 1949, 1 case in Chiclayo, June 1–July 31, 2 cases, 2 deaths in Monsefu; in Lima Department, Chancay Province, June 1–30, 1 case in Huacho; in Piura Department, Huancabamba Province, June 1–30, 1 case in Cabezas.

Smallpox

Netherlands Indies—Java—Bandoeng, Batavia, and Semarang.—Smallpox has been reported in cities in Java as follows: In Bandoeng, week ended August 13, 1949, 70 cases; in Batavia, week ended September 3, 312 cases, 36 deaths; in Semarang, week ended August 6, 280 cases, 14 deaths, week ended August 13, 142 cases, 37 deaths, week ended August 20, 94 cases, 17 deaths.

Peru.—During the period June 1–30, 1949, 495 cases of smallpox were reported in Peru.

Typhus Fever

France—Herault Department—Montpellier.—During the period August 21–31, 1949, 1 case of typhus fever was reported in Montpellier, Herault Department, France.

Peru.—During the period June 1–30, 1949, 157 cases of typhus fever were reported in Peru.

Yellow Fever

Sudan (French).—On September 15, 1949, 1 fatal suspected case of yellow fever was reported in Bamako, French Sudan.

DEATHS DURING WEEK ENDED SEPT. 10, 1949

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Sept. 10, 1949	Corresponding week, 1948
Data for 94 large cities of the United States:		
Total deaths	7,831	7,871
Median for 3 prior years	8,306	
Total deaths, first 36 weeks of year	332,175	335,176
Deaths under 1 year of age	560	614
Median for 3 prior years	694	
Deaths under 1 year of age, first 36 weeks of year	23,516	24,188
Data from industrial insurance companies:		
Policies in force	70,176,809	70,907,144
Number of death claims	8,887	9,687
Death claims per 1,000 policies in force, annual rate	6.6	7.1
Death claims per 1,000 policies, first 36 weeks of year, annual rate	9.3	9.5