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EDITORIAL[1]

TUBERCULOSIS RECORD SYSTEMS

Recent acceleration in tuberculosis control activities in State and local health departments has been largely motivated by mass radiography in case finding. The widespread application of small-film techniques has discovered more active, subclinical, and suspicious pulmonary tuberculosis than has ever been detected before in the history of public health. Even a casual survey of the majority of local programs reveals that quality and quantity of case finding have far surpassed the basic follow-up and case holding of newly discovered tuberculosis.

Simple and efficient tuberculosis record systems that are planned to meet local needs are fundamental to good follow-up procedures. They facilitate a maximum utilization of limited clinical, laboratory, and field nursing services. To correlate all phases of tuberculosis control, to bring about an equitable distribution of professional services, there exists an urgent need for extensive record systems based upon defined requirements. Even individual case management is hampered by the inadequacy of existing records.

With the rapid expansion of local, State, and Federal activities, local registers and record systems have assumed additional significance. In a local area with an established tuberculosis control program, a case register has repeatedly been recommended for case management, for current inventory of the case load, interval evaluation of the effectiveness of activities in relation to their cost, and for a realistic knowledge of the extent of the problem.

Now that State and local health departments are launching State, county, and city projects to find cases and to give medical supervision

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[1] From the Office of the Chief, Tuberculosis Control Division.

to ambulant persons, tuberculosis record systems and coordinated local registers become essential, if the full benefits of any new program are to be experienced. Inefficient record systems will encumber and defeat the most promising of tuberculosis control programs. However, smoothly functioning record systems, even though they precede necessary services, may well be the essential administrative tool needed for the development and eventual success of the program.

Local registers are especially useful in individual case management. State tuberculosis record systems that contain summarized information from local sources are essential in program supervision, planning, and evaluation. Semiannual or annual compilation of uniform data from the State health departments makes possible a concise and current national summary of the extent and results of case finding, the ultimate disposition of cases discovered, and the trends in morbidity and mortality. In addition, such a summary presents an opportunity to base long-range planning on predictions derived from analyses of reliable data. Comparisons of State records can easily be made and, as areas of great need become apparent, additional funds and personnel can be concentrated in any given community before irreparable damage to public health is done.

The tuberculosis services of a health department cannot be described by statistics alone. However, a combination of meaningful statistical summary and professional description of nonquantitative tuberculosis activities can supply the best answers to the administrator who must justify his health program in terms of protection of the community, extent of the problem, effectiveness of all activities, and funds expended.

Well-planned and effective record systems can make the practice of public health, as applied to tuberculosis control, really a science and not just empirical guesswork. Many questions in the epidemiology of tuberculosis remain unsolved. They require solution before eradication of the disease can be realized in a measurable time. Better records, and time for their analysis, could reduce the number of past mistakes and enable us to determine if what we have proposed and carried out has accomplished the desired end.

THE MODALITIES OF BED REST [1]

By WILLIAM M. PECK, M. D.[2]

Recent criticisms (*1*) have been made of bed rest as a therapeutic agent in many kindred medical fields. The consensus of these

[1] Presented before the meeting of the Illinois Trudeau Society, Rockford, Ill., Feb. 27, 1946.

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criticisms seems to be (*a*) that prolonged rest in bed is potentially harmful, and (*b*) that it is of too little therapeutic value to justify the risks which it entails. Most authors have circumspectly avoided applying their generalizations to tuberculosis, yet to those in phthisiology it is challenging to reevaluate our concepts of bed rest in the light of such current skepticism. We should ask ourselves the following questions: What are the dangers of bed rest as they apply to the tuberculous person and are they commensurate with the risk which patients must take from tuberculosis when treated without bed rest? or, more constructively, Is it possible to distinguish among these various factors of bed rest in such a way as to reduce the dangerous ones to a minimum while exploiting to the utmost those which seem beneficial? Has a clinical finesse, perhaps, a much more prominent place in conducting a bed-rest program than conceded to it in recent years?

Several factors have served to direct our attention away from such questions. For one thing, bed rest in tuberculosis has long been accepted as a therapeutic verity and as a result, we have ceased to pay it much attention. We have been trained to pay it lip service even while turning our backs on it. In a general way the bed-rest program has become a nursing problem while the physician's chief interest has become the collapse program. In most modern sanatoria collapse is applied extensively, so that the results of bed rest, good or bad, can seldom be distinguished clearly from those of the associated collapse. The increasing tendency to think of bed rest in terms of quantity or duration, rather than quality, has also served to diminish appreciation for its mode of application.

The present report is an attempt to present a concept of bed rest which has been evolved at Maybury Sanatorium, Northville, Mich., while following a group of very far advanced patients who had been rejected for the collapse program because of extent of disease and limited respiratory reserve. It was evolved as certain factors began to stand out prominently in deciding the eventual outcome. The fundamental considerations are not in themselves original and any uniqueness in the concept is due merely to emphasis and to technique of application.[3] A recent statement from this institution briefly described the concept (*2*).

In the past those patients rejected for collapse because of extent of the disease had been left at bed rest with medical supervision confined mostly to answering complaints or ordering codeine, sedatives, and eyewash. Since the prognosis was almost uniformly bad, the group was regarded as requiring a domiciliary rather than a therapeutic

[3] Dr. Roger Hanna at a meeting of the Michigan Trudeau Society some years ago stressed the need for close medical supervision of the bed-rest program and cited the importance of postural aspects.

program, and when an exceptional recovery occurred, it was considered almost as an anomaly.

Several years ago, we began to wonder if such a pessimistic attitude was really warranted and if very careful medical supervision might alter our attitude. As a result, we established a small service for such patients with added nursing facilities and close dietary supervision. Since the number of beds at any one time was limited, selection was shown to the extent of excluding recalcitrant patients and those with personality defects which would obviously make a high degree of cooperation impossible. These patients were then placed on a regimen of very strict bed rest with instructions never to sit up, never to raise the head from the pillow, and to lie as inertly as possible. Shortly, difficulties began to appear. Cough frequently increased with roentgenological evidence indicating poor drainage of secretions, and a few patients showed serious extension of disease. Many of them became nervous and tense and complained much more of fatigue than before going to bed. It seemed obvious that strict bed rest at times might be harmful—actually defeating the purpose for which it was given. The problem seemed to be how to maintain the advantages of strict bed rest and yet eliminate these difficulties.

The Problem of Adequate Drainage

Upon analyzing these cases further we realized that most patients at bed rest, when left to their own devices, spend much of the time in

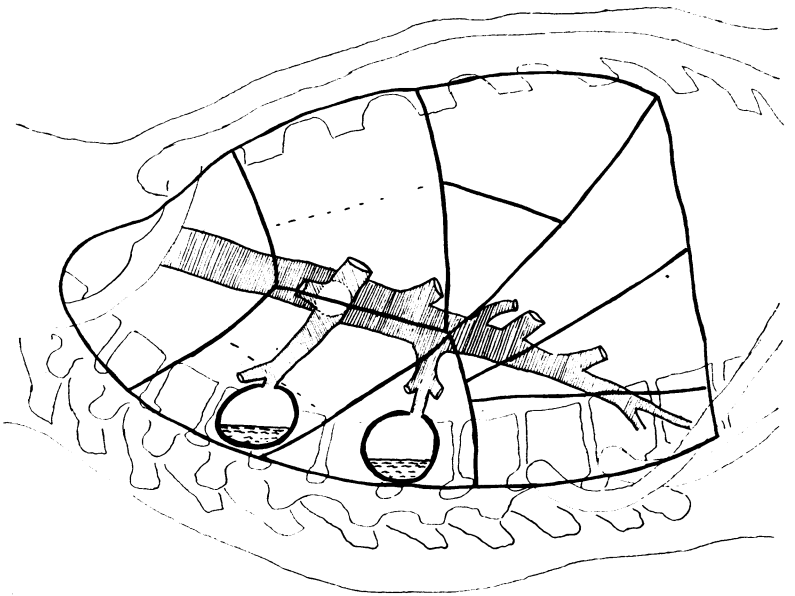

Diagram illustrating the problem in adequately draining cavitation of two commonly involved bronchopulmonary segments when patient remains in the supine position.

a supine position. Unfortunately, as we all know, cavitation occurs with notable predilection in the posterior portion of the chest. Current studies at Maybury show that in the upper lobe, the posterolateral segment is most commonly involved and in the lower lobe the dorsal segment is by all odds the most common site of cavitation. Obviously we had violated the most fundamental law underlying the treatment of all suppurative lesions; namely, that of obtaining adequate dependent drainage. In abscesses elsewhere in the body we place the greatest insistence on this principle. We observe it scrupulously in bronchiectasis. In empyema our first concern is to obtain adequate dependent drainage. Even in pulmonary abscess the success of the treatment is contingent upon adequate dependent drainage. Yet in tuberculous pulmonary abscess (or cavity) most of us ignore the question wholly and even encourage a regimen which deliberately places the cavity in the worst possible position for drainage. Under such conditions cavitary contents can be removed only by hard, forceful cough which will disseminate the sputum throughout the tracheobronchial tree. Little wonder that some patients on bed rest became more toxic and developed serious spreads of their disease. Unfortunately, most of us have been trained to visualize the chest as a two-dimensional roentgenogram and we rarely think of the third dimension, which is the one of greatest importance in the recumbent patient. Possibly 40 percent of such patients will have bronchiectasis and a number of them will have tracheobronchial disease. Frequently, in primary disease large lymph nodes block the draining bronchi. These facts emphasize the need for adequate drainage.

A brief trial was made to improve drainage by elevating the foot of the bed, but it was soon realized that the problem was not so much elimination of sputum from the trachea and larger bronchi as from the involved bronchopulmonary segments where disease had most severely interfered with the normal cleansing mechanism.

A system was next introduced which seemed to be very successful. Patients were simply instructed to lie in all four positions—prone, supine, and either lateral position—at intervals throughout the day. Usually they were told to change position about every half hour. In cases where changing position would induce cough, however, it was felt that too much time had been spent in the preceding position so that secretions had accumulated in the dependent part. Emphasis was placed on the patient's comfort, and he was encouraged always to seek a comfortable, relaxed position without deliberate clock watching. Such a regimen not only permitted drainage from diseased areas but prevented stasis of contaminated secretions in normal areas of the lung, and it enlisted the patient's cooperation by making him an active participant in the treatment.

In the patient with unilateral cavitation the plan was modified only to the extent of suggesting that he not deliberately sleep on the less involved side. The idea that one may be able to maintain contralateral asepsis by keeping the diseased side always in a dependent position is untenable when one considers the splattering effect of cough on iodized oil during the course of a bronchogram. Such graphic evidence shows that severe cough may cause gross and repeated contamination of the entire tracheobronchial tree. On the other hand, any regimen which encourages free drainage with little or no necessity for cough should minimize such contamination.

Several other therapeutic manipulations were frequently useful supplements in promoting free drainage. Evidence of bronchospasm often appeared, giving rise to wheezing, feeling of "tightness in the chest," attacks of dyspnea, difficulty in raising sputum, or paroxysmal cough. When suspected, aminophyllin or vaponephrin were used freely, often with very gratifying relief of symptoms. From this experience it was felt that bronchospasm is a common factor in unsatisfactory pulmonary cleansing, often difficult to apprehend but yielding dramatically to proper therapy.

Sputum, to be effectively raised, should be of a viscosity optimum for ciliary cleansing. Thick, tenacious sputum is raised only with the greatest effort. On the other hand, watery sputum is liable to cause alveolar flooding with dangerous extension of disease. It seemed advisable, therefore, to watch the character of the sputum closely and to rely on steam inhalations (rather than less easily controlled chemical methods) to thin tenacious sputum which appeared to interfere with bronchial cleansing.

A profound conviction has developed that proper manipulation of such mechanical factors can usually establish successful pulmonary cleansing with little or no necessity for cough. Codeine was seldom necessary and then only in small amounts at specified intervals. The necessity for using codeine was regarded rather as an admission of failure in controlling cough and pulmonary evacuation by strictly physiological methods. In the presence of tracheobronchial disease the methods were most difficult to apply but also probably most urgently needed.

The Problem of Muscular Relaxation

Presumably the most obvious aim in bed rest is to decrease respiratory requirements to the point where a high degree of pulmonary rest is actually achieved. Since many of the patients in this group became hyperpneic on slight exertion, the need for maximum reduction in pulmonary work appeared unusually pertinent. It seemed that this might be best achieved by deliberately teaching muscular

relaxation. A method somewhat similar to Jacobson's (*3*) was used in which the patient was taught to recognize muscular tenseness and to overcome it by concentration on the part. Whether the method was successful, or whether it was merely the constant, daily suggestion and encouragement does not matter. The fact remained that an amazing degree of relaxation usually could be mastered. As a patient became more and more relaxed his breathing decreased somewhat in rate and became perceptibly more shallow. He became rested and developed a feeling of well-being. The sore back and muscular aching, which invariably were present at the beginning of bed rest, disappeared and rest in bed actually became pleasurable. Obviously, under such conditions much muscular tone was lost but tone seemed to serve no useful purpose in the bedfast patient and was readily regained when needed.

The Problem of Mental Repose

At first, problems in emotional maladjustment appeared prominent and threatened often to undermine all other efforts to give satisfactory bed rest. Despair over finances and frustrated ambitions, terror of the diagnosis, worry over the health of family contacts or loyalty of marital mates had left many patients emotionally sick and given to morbid preoccupations. Enforced recumbency seemed to heighten emotional crises and to produce a train of undesirable sequelae, such as despondency, nervousness, tenseness, apprehension, insomnia, gastrointestinal complaints, or unnecessarily severe cough.

In these patients, already seriously ill with tuberculosis, such failure to achieve emotional calm is extremely serious, and often bears directly on the final issue of the case. As such, the prompt recognition and solution of the individual problem might be regarded almost as a medical emergency.

For instance, a 19-year-old girl was admitted some months ago with very extensive pulmonary tuberculosis. She was exhausted and gratefully accepted a regimen of strict bed rest. Six weeks later a phenomenal degree of improvement—both clinical and roentgenological—had occurred. At this time her course suddenly altered and she became very despondent, spent much of her time crying, ate little, and slept poorly. Her cough became uncontrolled, and serial roentgenograms showed marked progression of her disease. Later it was learned that she had been brutally accused at that time of having infected a friend with tuberculosis and that the shame of a "murderess" had compelled her to conceal this basis for her despondency.

A 39-year-old male with extensive, far-advanced pulmonary tuberculosis became extremely apprehensive after admission. He remained

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very tense and excited at bed rest, complaining of fatigue and muscular aching. His cough was excessive, and extension of disease occurred in spite of his frightened efforts to cooperate. Several months later he stated that on the day of admission a maid, while unpacking his clothes, had casually remarked that tuberculosis was really incurable and that our only concern was in "keeping him off the street." With proper reassurance he was able to regain emotional stability and has since controlled his disease sufficiently to permit thoracoplasty to be successfully completed.

These and similar examples indicated the need for meticulous attention to proper adjustment. In an effort to avoid such incidents, it became the practice to spend much time with each patient, establishing suitable rapport and seeking out his problems. Psychological, social, and economic difficulties were discussed in detail and simplified when possible. A deliberate attempt was made to indoctrinate him with a philosophy which would allow him to accept his disease with equanimity even while maintaining enthusiasm for the future, and to regard the vexations of prolonged recumbency as a small price to pay for eventual recovery. An effort was made to counterbalance his fears by giving him a new basis for security—a steady confidence that recovery could in large part be determined by his own efforts in cooperating with the bed-rest schedule. With a view to subsequent rehabilitation, he was encouraged soon after admission to make plans for the future and even to start limited courses of study. Since the morale of the patient varied sensitively with the attitudes of those about him, it was necessary to keep ward attendants and the patient's relatives constantly reminded of their responsibility in this matter.

Attention to the emotional adjustment in the bedfast patient seemed to be one of the most rewarding therapeutic maneuvers, because it yielded results that wholly compensated for the time involved. It seemed clear that this should be regarded as a prime medical responsibility which, under no circumstances, should be left to the caprice of fellow patients or untrained personnel. Failure to obtain mental repose, in most instances, may be regarded as a serious reflection on the finesse of the medical care.

Discussion of Results

In this way, a concept of bed rest was evolved which was based on three fundamental modalities: Adequate drainage, muscular relaxation, and mental repose. We have learned to rely heavily on them as a yardstick in measuring the trustworthiness of bed rest as a therapeutic agent. When present, great confidence may be placed in the rest, but when absent, one may question the value of the regimen and anticipate various difficulties.

This concept takes the supervision of rest out of the nursing field and makes it a distinct medical responsibility, demanding the utmost in flexibility and individualization in meeting the vicissitudes of prolonged illness.

Because this concept was developed while observing patients unsuitable for collapse, it must not be inferred that it in any way competes with, or is antagonistic to, a full collapse program. On the contrary, it is designed to provide an understructure upon which a modern collapse program can be most satisfactorily established, and is intended to bolster a weak point in therapy rather than to degrade a strong one. Nevertheless, it must not be inferred that we think all patients should be treated by strict bed rest. We do believe, however, that the three modalities should be borne in mind while planning a bed-rest regimen, whether strict or modified.

It is too early to draw final conclusions from the groups of cases observed on this regimen but certain trends seem to be sufficiently obvious to warrant a preliminary statement. At this point it must be regarded as an illustrative rather than a statistical study. To date 69 patients have been treated in this manner at various times. The group is not larger because handling such sick patients has been time-consuming. Many of them were severely emaciated with marked anorexia. Some required prolonged parenteral feeding with protein hydrolysates before sufficient food could be ingested by mouth. All required very careful supervision of high protein diets to correct the the hypoproteinemia which was almost invariably present. Transfusions were often used to correct anemia.

Most of the patients had extensive bilateral disease, usually with bilateral cavitation, and obviously could not have tolerated the amount of collapse necessary to control the disease. There were only a few exceptions in cases where contra-indication to collapse was severe bronchial disease, or marked exudative quality of the lesion. Ages of the patients ranged from 12 to 45 years, with the majority being in the third decade. There were 43 women and 26 men; 8 were Negro. Of the entire group of 69 patients, 19, or 28 percent, had cavity closure with sputum conversion, 14 more had sufficient healing to permit limited thoracoplasty (some of these have thoracoplasty completed, while others are waiting for the operation). Twenty-six have been under treatment too short a time for definite evaluation. Half of these, however, have shown satisfactory improvement and half have failed to improve or have become worse. So far 10 patients (15 percent) have died. For those who died, the mean duration of hospitalization was only 4 months. Altogether, 42, or 48 percent, have either successfully controlled their disease or have healed it to a point where thoracoplasty could be undertaken.

Case Histories

CASE 1

C. F.—This 17-year-old white boy gave a history of insidious onset in July 1942. At admission on October 30, 1942, he was in poor general condition. His fever went to 101, and his respiratory rate varied from 22 to 30 per minute. There was cyanosis of the nail beds. Cough was severe and productive of about 1 ounce of tenacious mucopurulent sputum. Paroxysmal cough at mealtime induced vomiting. Sputum was positive on direct smear. The total white blood cell count was 22,500 with 88 percent neutrophiles. Roentgenogram (fig. 1A) showed infiltration of the mixed type throughout both lung fields. On the right there was a 5-cm. cavity in the apex of the lower lobe and 2½-cm. cavity in the upper lobe at the level of the first rib. This patient was too ill and had bilateral disease too extensive to permit collapse of any kind. He was placed on a regimen of strict bed rest and was allowed to lie mostly on his back. Roentgenological examination on April 28, 1943 (fig. 1B), showed some clearing of infiltration but revealed that the cavity in the lower lobe had increased in size. Since tuberculosis of the lumbar spine was also discovered, he was placed on a Striker frame so that at intervals throughout the day he could be turned in both prone and supine positions. His condition improved dramatically; the cavity decreased in size, and was no longer visible on November 8, 1943. His sputum became negative on concentration on January 29, 1944. Patient has remained in hospital because of spine lesion but is now being prepared for discharge. Figure 1C represents current pulmonary status.

CASE 2

P. S.—This 12-year-old white girl gave a history of an insidious onset in August 1942. Diagnosis of a lesion on the right was made several months before admission. The patient was placed in bed at home on a regimen of very strict bed rest and was instructed to lie constantly on the right side. Cough increased and was associated with great difficulty in raising sputum. At admission on March 2, 1943, the patient was seriously ill with fever going to 102, and with a respiratory rate of 24 to 26. Sputum was positive for tubercle bacilli on direct smear. Roentgenological and physical examinations (fig. 2A) seemed to indicate that the right lung had become inundated with its own secretions. Bronchoscopic examination showed no evidence of an obstructive lesion. The patient was considered too ill for collapse therapy and was placed on a regimen of bed rest with particular attention given to drainage (see text). Her sputum converted and she improved dramatically. Film shown in figure 2B represents condition of lung at discharge, September 2,

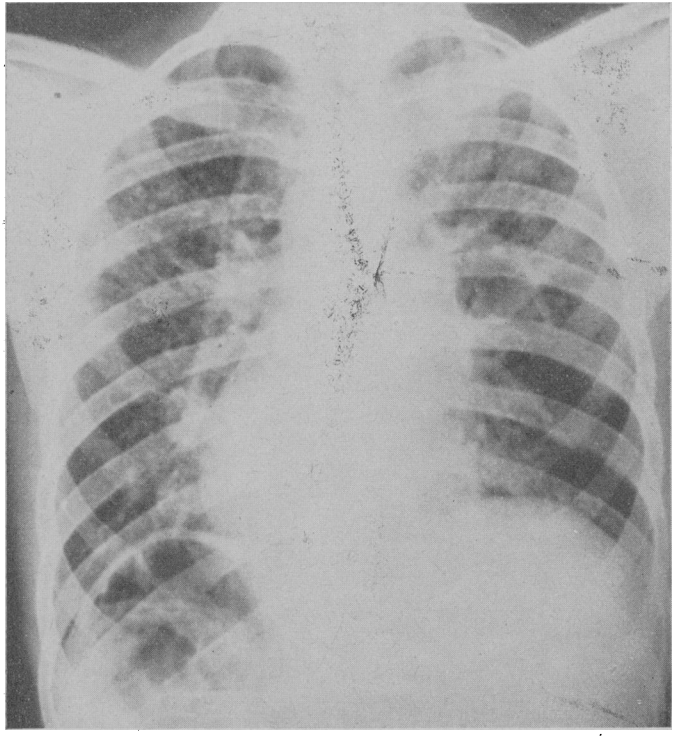

FIGURE 1A.—Case 1

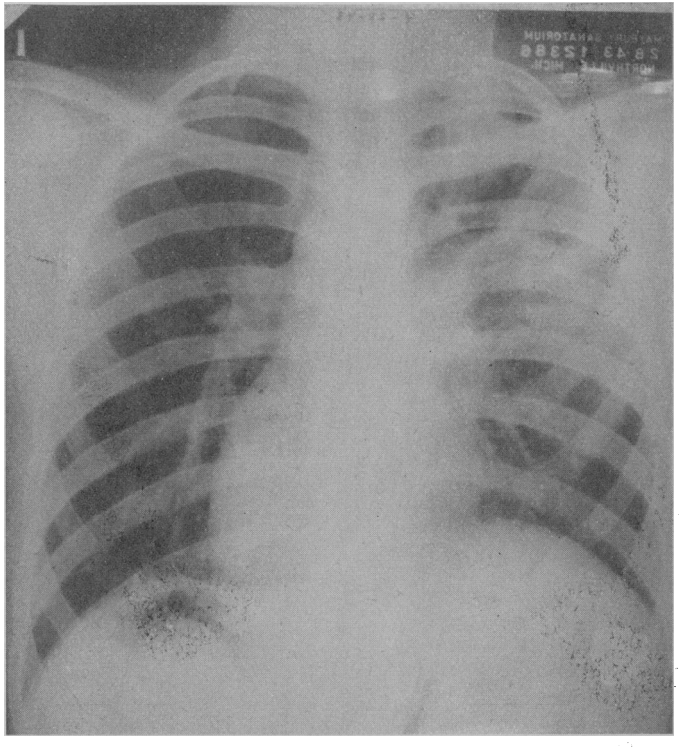

FIGURE 1B.—Case 1.

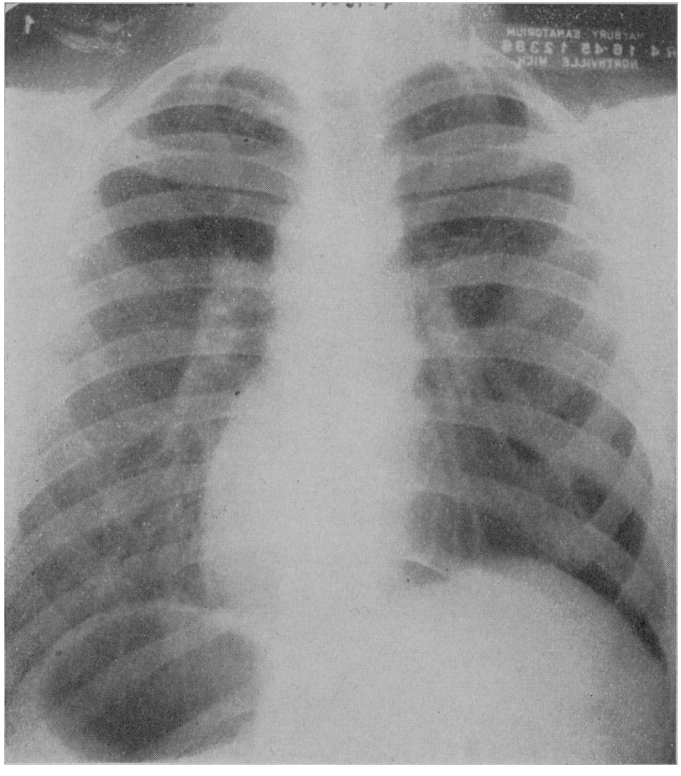

FIGURE 1C.—Case 1.

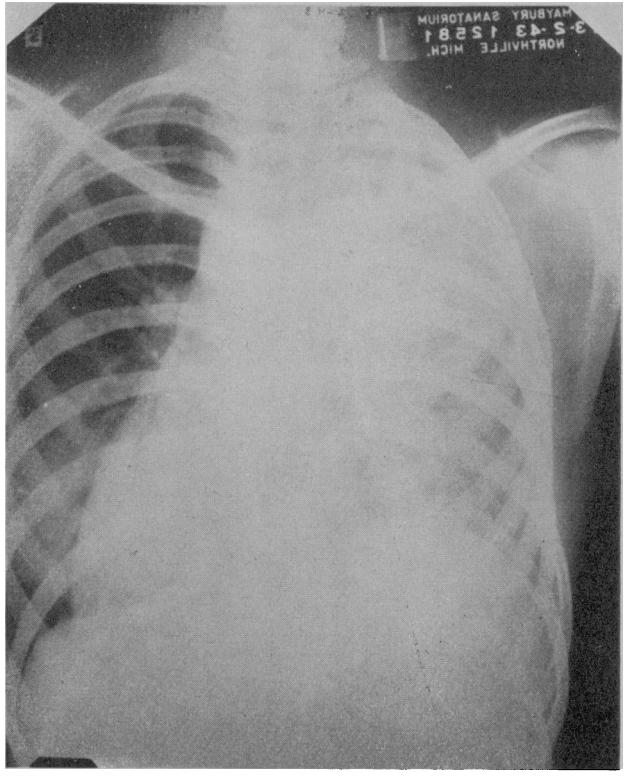

FIGURE 2A.—Case 2.

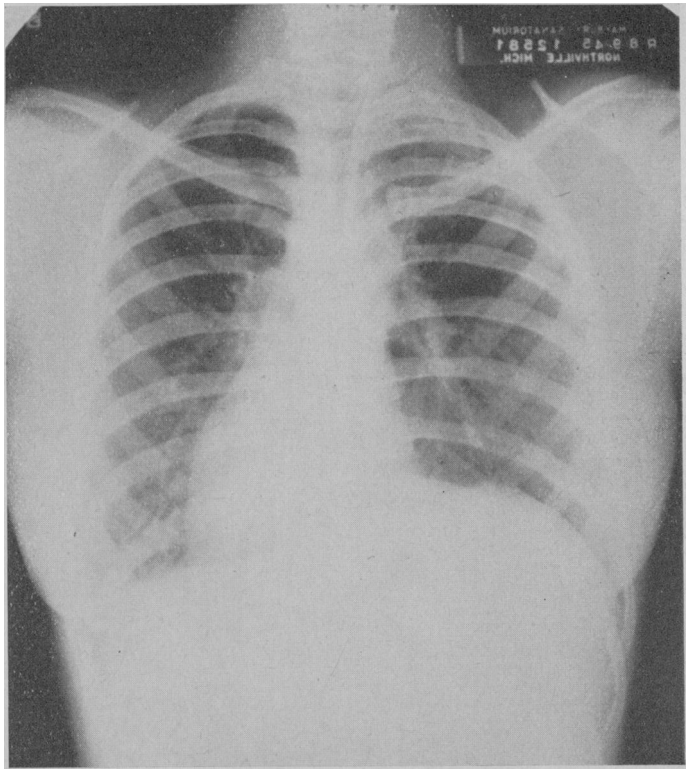

FIGURE 2B.—Case 2.

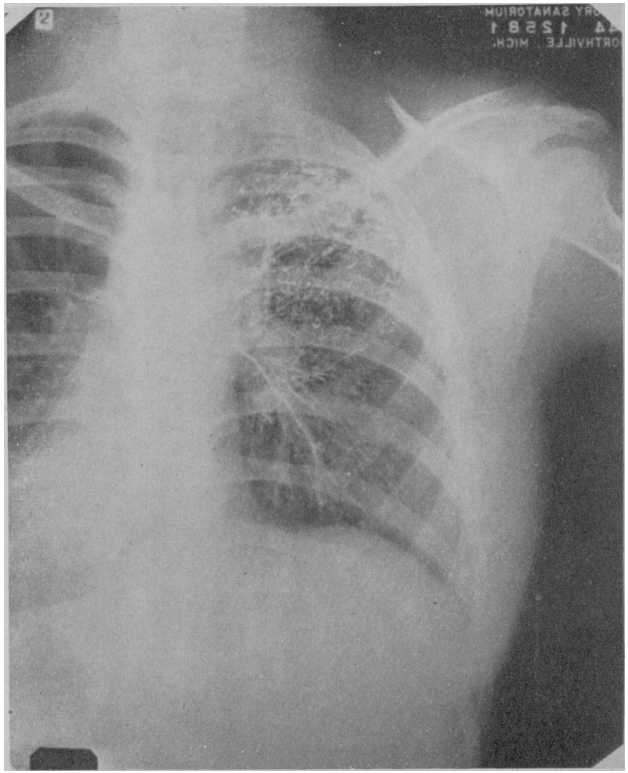

FIGURE 2C.—Case 2.

1944. Bronchogram at this time showed residual bronchiectasis in the right upper lobe. It is illustrated in figure 2C. It was felt that unintelligent bed rest had jeopardized the patient's life and may well have caused the residual bronchiectasis.

CASE 3

W. H.—This 20-year-old white male gave a history of an insidious onset January 1943. At admission on July 22, 1943 he was in poor general condition with dyspnea on mild exertion and with some cyanosis of the nail beds. He had a low-grade fever. Cough was moderately severe and sputum contained tubercle bacilli on direct smear. Barium meal studies showed tuberculous enteritis. Roentgenogram of chest (shown in fig. 3A) revealed infiltration involving the whole of both lung fields with extensive bilateral cavitation. The patient's limited respiratory reserve seemed to contraindicate all collapse procedures. He was placed on a regimen of careful bed rest. Cavity closure appeared complete, November 24, 1944, and sputum became negative to concentration during the same month. His general condition is now excellent, and he is ready for discharge. Possibly he has remained in the sanatorium longer than necessary. Figure 3B shows the marked degree of clearing and, indeed, of recovery that had taken place.

CASE 4

N. M.—This 23-year-old white woman gave a history of symptoms for 1 year. At admission on April 9, 1943, she was in poor general condition with fever going to 102. She complained of dyspnea at bed rest, although her respiratory rate varied from 20 to 24. She had severe abdominal cramps and barium-meal studies disclosed evidence of tuberculous enteritis. Her sputum contained tubercle bacilli on direct smear. Roentgenogram of chest (fig. 4A) revealed extensive infiltration of the exudative type throughout the right lung with a 1.5-cm. cavity at the second rib. On the left, dense areas of exudative infiltration were found in the upper half with a 6- or 7-cm. cavity in the apical region. Her limited respiratory reserve prevented all consideration of collapse procedure at that time. The patient was placed on a regimen of strict bed rest. By November 14, 1944, (fig. 4B) she had improved sufficiently for thoracoplasty. This has since been successfully completed and the patient has been discharged.

CASE 5

B. R.—This 23-year-old white woman experienced an insidious onset September 1942. At admission on January 26, 1943, she was in fairly poor general condition with moderately severe cough. She

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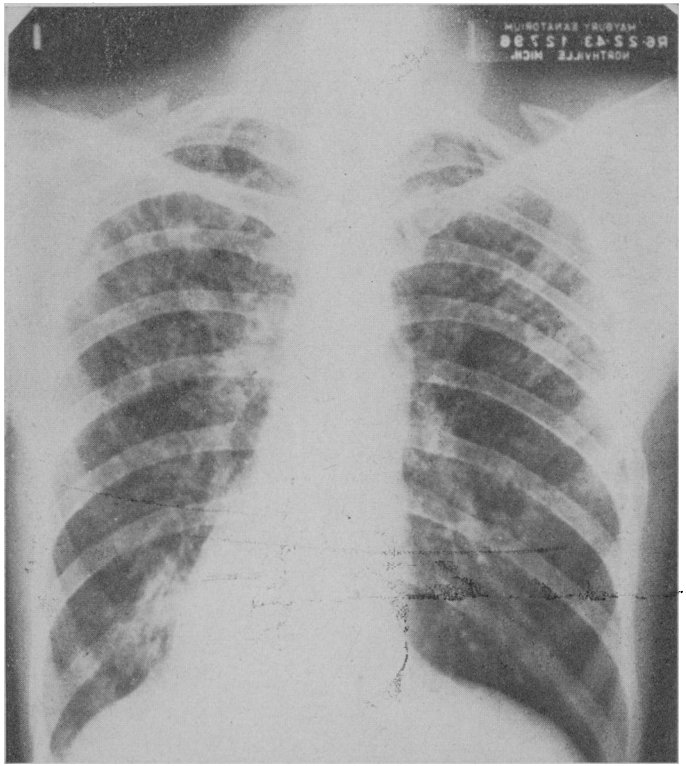

FIGURE 3A.—Case 3.

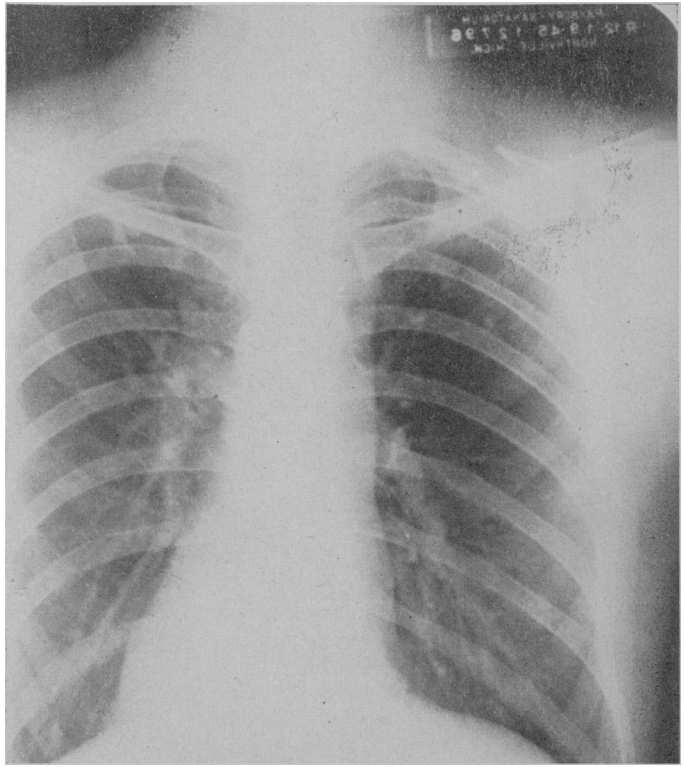

FIGURE 3B.—Case 3.

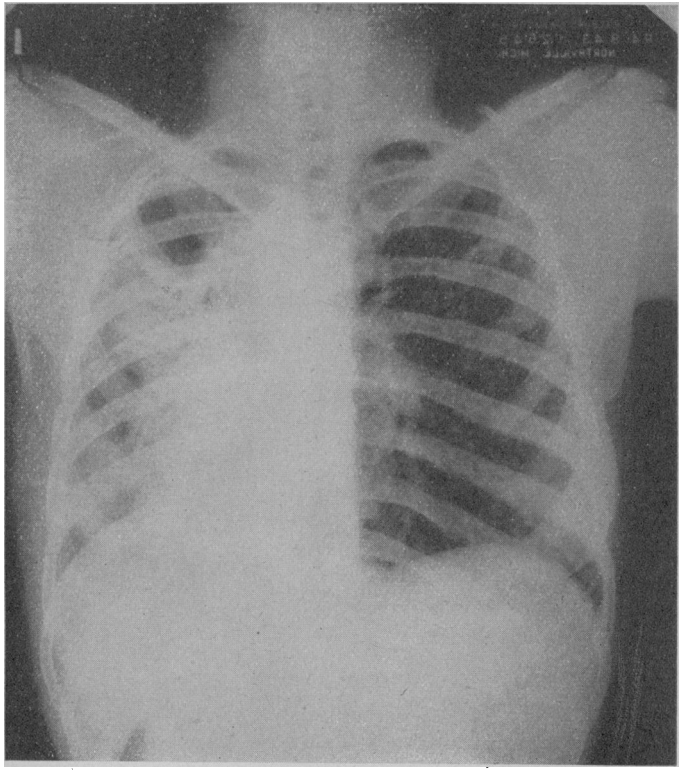

FIGURE 4A.—Case 4.

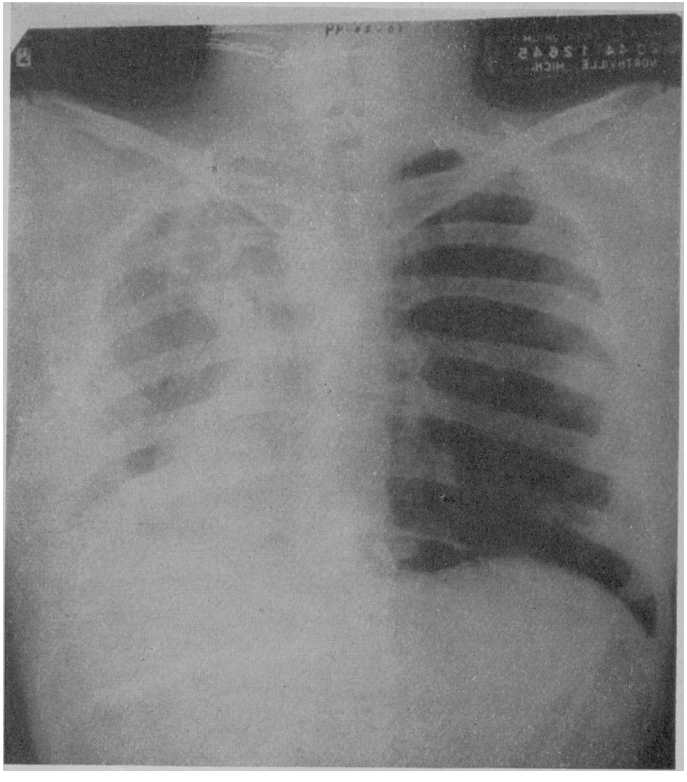

FIGURE 4B.—Case 4.

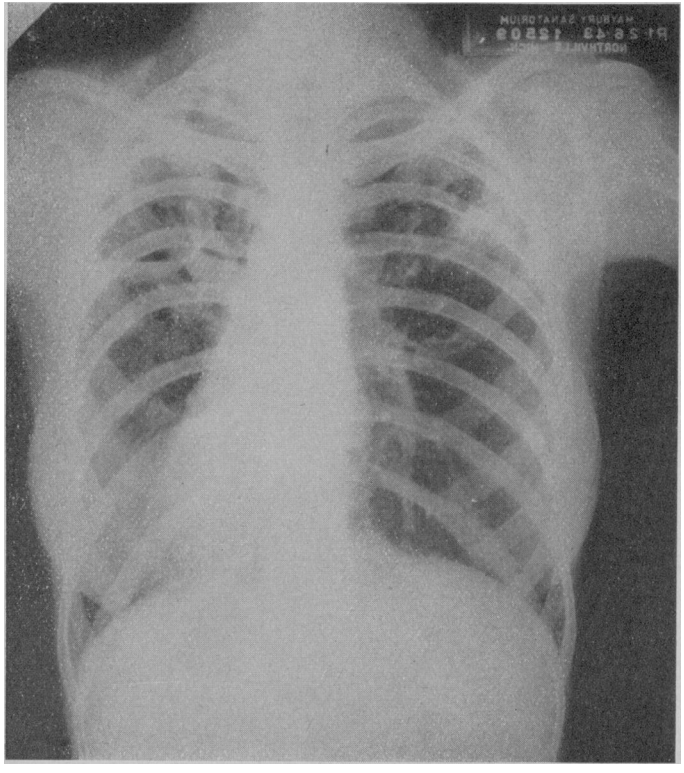

FIGURE 5A.—Case 5.

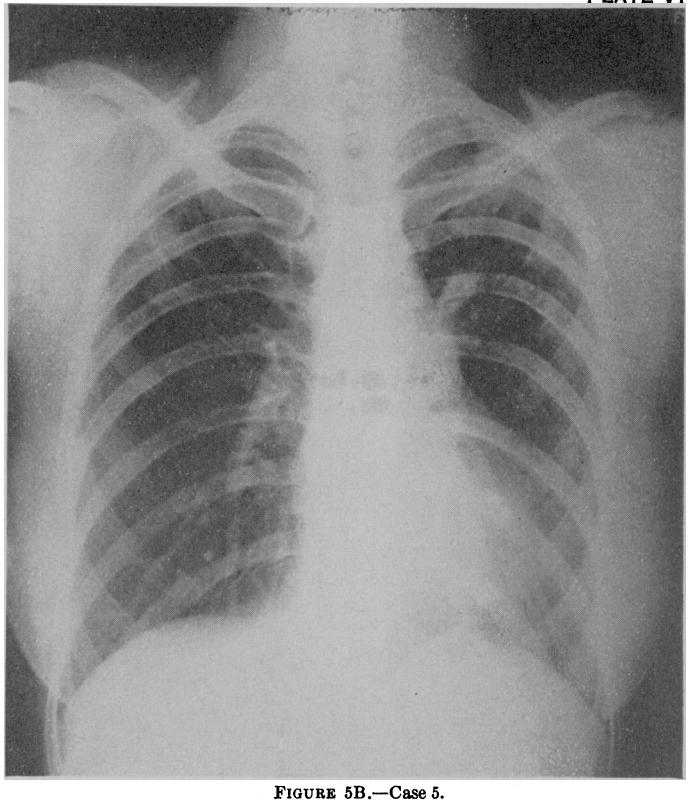

FIGURE 5B.—Case 5.
(Reversed from left to right)

had a low-grade fever. Sputum was positive for tubercle bacilli on direct smear. Chest roentgenogram showed on the right scattered infiltration in the upper half of the lung with several areas of cavitation, the largest of which was 3 cm. On the left were scattered infiltrations in the upper half with a 7-cm. cavity in the infraclavicular region. This is illustrated in figure 5A. It seemed obvious that the patient could not have tolerated extreme bilateral collapse sufficient to control her lesion. The patient was placed on a regimen of careful rest. Cavity closure appeared complete on October 14, 1943, and was soon followed by sputum conversion. She transferred to another institution on November 28, 1944, and was discharged about 6 months later. Figure 5B shows final status after lesion had ceased to change.

An attempt has been made to obtain a control series from patients discharged in 1942 who were left at bed rest without close medical supervision. Sixty-nine consecutive cases in a similar age group, with comparable pulmonary lesions, were selected, not including those with frankly terminal disease. Obviously, such a control group selected in retrospect and involving the possibility of personal bias, is not altogether above criticism. In this control series, however, 2 patients had cavity closure and sputum conversion without collapse; 7 controlled their disease, so that thoracoplasty was feasible; 12 were discharged unimproved; and 48 died. The results in the present group of patients who were treated by careful supervision of bed rest are probably misleadingly good, since, for the most part, they represent the early results. Late results may be anticipated to be less gratifying. Nevertheless, they fully demonstrate that carefully supervised bed rest is potent therapy that gives results entirely commensurate with the time and energy involved. These data are presented in the following tabulation:

	Number	*Cavity closure and sputum conversion*	*Prepared for thoracoplasty*	*Improved*	*Unimproved*	*Dead*
Group with supervised rest	69	19	14	13	13	10
Control group [1]	69	2	7	0	12	48

Conclusions

1. A concept of bed rest has been described which is based on three fundamental modalities: (*a*) Adequate drainage; (*b*) muscular relaxation; and (*c*) mental repose.

2. A group of 69 patients with far-advanced tuberculosis unsuitable for the collapse program were treated by carefully supervised bed

[1] Control group consists of 69 consecutive cases unsuitable for the collapse program who were discharged in 1942. Those with frankly terminal disease were eliminated so that the two groups are comparable as to extent of pulmonary lesions.

rest, based on this concept. Nineteen had cavity closure and sputum conversion; 14 more had sufficient healing to permit thoracoplasty; 13 improved; 13 failed to improve; and 10 died. A control group of similar patients treated with bed rest without special consideration to this concept has been presented.

3. Bed rest is inherently valuable but unreliable when administered indifferently. It warrants constant, critical attention by the physician in order to insure good results.

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REVIEW OF TUBERCULOSIS CONTROL DEMONSTRATIONS AND THE PROGRAM OF GRANTS-IN-AID [1]

By FRANCIS J. WEBER, *Senior Surgeon, United States Public Health Service*[2]

For many years tuberculosis has been neglected to a certain extent because of widespread failure to recognize the problem and because of inadequate financial support. Public Law 410, enacted by Congress in June 1945, went far in improving these conditions. This law created the Tuberculosis Control Division in the United States Public Health Service and authorized the appropriation of funds for the support of the new Division and for money grants to the several States. The present paper constitutes a brief review of the activities of this Division since its formation, with particular reference to the work of field demonstrations and the new program of grants-in-aid.

Assistance to the States and Local Communities

When this Division began operation on July 1, 1944, many practical problems presented themselves, particularly those caused by personnel and material shortages owing to the prior claim of the war effort. Furthermore, the new law contained merely an authorization for funds and did not, in itself, provide an appropriation. Consequently, one of the first steps was to dispatch medical consultants to the field in the fall of 1944 to make surveys of the needs of individual States. In each State a realistic estimate of the sum needed to initiate or expand tuberculosis control programs was secured. The combined estimates of all the States then formed the basis of the first request for funds. Because of war restrictions, however, the sum finally voted by Con-

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gress was considerably smaller than would have been forthcoming under ordinary circumstances. Moreover, there was a long delay in making available the appropriation for the first year with the result that funds did not reach the States until the last 6 weeks of the fiscal year.

In spite of such postponement of funds, the program began, and the State Aid, Radiology, and Field Studies Sections were organized. Space does not permit a detailed account of the functions and activities of all sections within the Division since such accounts must await the appearance of future issues. Suffice it to say that it was possible to inaugurate the programs of these three sections with money made available from Emergency Health and Sanitation funds even before a regular tuberculosis control appropriation was made available. Training programs were inaugurated; field demonstrations were started; new and improved record-keeping systems were developed; the services of special consultants were acquired; and basic research in field problems was initiated. Therefore, when the first grant to the States became available on May 15, 1945, it was possible to go forward with a national program which, in its basic organization at least, was complete. Since the program is now close to the end of its first full year of operation, it would seem appropriate to review some of the accomplishments of the field program during the period.

Assistance in tuberculosis control, from the United States Public Health Service to the State and local communities, may be considered under two main headings: (1) Direct services rendered by the Division through demonstrations and the loan of personnel and material; (2) Money grants to the States for expenditure by the States themselves in the development of more effective measures of prevention, control, and treatment of tuberculosis.

Demonstrations and Other Forms of Direct Assistance

The Division was able, even before grants-in-aid became available, to assist the States and local communities in many ways. During the first year, the Division conducted a training program with courses for 35 medical officers, plus 5 from foreign countries, while other courses of instruction were given for nurses and record analysts. In addition, the Radiology Section, in cooperation with the Saranac Lake Craft Guild and the Bureau of Vocational Rehabilitation, trained 53 photofluorographic operators. Many of the persons so trained (27 medical officers, 25 nurses and other nonprofessional personnel) were lent to State and local communities to assist in the development of control programs. Such assistance was particularly valuable because it came to the States in a time of critical personnel shortages.

Demonstrations designed to show the value of modern techniques in

case finding have been one of the principal activities of the Division. The chief tool of these demonstrations is the photofluorograph, and its effectiveness was evidenced by the rapid and exact examination of large population groups. It should be mentioned, however, that the case-finding program and demonstrations actually antedate the formation of the Division. In the beginning, when the Division was a section of the States Relations Division, case-finding demonstrations were carried on by eight small-film units. When additional funds were made available, however, it was possible during the first year of operation as a division to expand the number of these photofluorographic units to 20. Technical improvements developed by the Radiology Section increased the efficiency and economy of operation of these units. At the present time one small-film unit, with a team consisting of a medical officer, a technician, and a clerk, is able to finish an average of 500 examinations per 8-hour working day.

These units have been loaned to State and local communities upon request and full teams of operating personnel have been sent with them. In every instance these units have proved their usefulness as practical instruments for the discovery of cases of tuberculosis during the early remediable stages of infection. Since the beginning of these demonstration programs in 1942, over 1,000,000 persons have been examined. Of this total, 1.2 percent were found to have reinfection tuberculosis, and of those found to have active disease over two-thirds were in the minimal stage.

Table 1 gives a complete break-down by stage of infection of the results of these examinations conducted over a period of 3 years, including work in 29 different States. Such demonstrations leave no doubt that tuberculosis, by concerted community effort, can be discovered early enough so that, with adequate follow-up and treatment, the majority of infectious cases can be removed from the population and brought to early arrestment. These demonstration projects have enabled local communities to begin and to carry on effective case-finding and follow-up programs. Experience has shown that communities which have been the recipients of demonstration programs

TABLE 1

Number of films taken	Number of films analyzed	Total number of cases	Percent	Reinfection tuberculosis					
				Minimal number	Percent	Moderately advanced number	Percent	Far-advanced number	Percent
1,353,901	1,035,303	[1] 12,508	1.2	8,377	69.2	3,070	25.4	648	5.4

[1] Includes 413 cases for which no further analysis was received.

usually continue the work with their own personnel and equipment following completion of the demonstrations.

A majority of those examined by Public Health Service Demonstration Units have been industrial workers, mainly those engaged in war industries. While industrial workers, as a group, will continue to loom large in future mass radiography programs, a program is already under way, through the joint efforts of the American Hospital Association, the National Tuberculosis Association, and the United States Public Health Service, to have all general hospitals participate in the case-finding program by providing for the routine X-ray examination of all general hospital admissions and out-patients. Several large and small hospitals have already demonstrated the value of chest X-ray as a routine procedure, and one of these (*1*) with a program in operation during a period of 4 years, reports 9.3 percent of the total examined to have intrathoracic abnormalities with approximately 1.5 percent showing X-ray evidence of tuberculosis. The hospital group is quite a large one; the record shows that 16,000,000 persons entered general hospitals during 1944 (*2*). The work with this group, therefore, will be an important part of the national program.

Grants-in-Aid to the States

The pattern of grants-in-aid for tuberculosis control is similar to that of the older grant programs, such as general health and venereal disease control. With the single exception of specific purposes for which each separate fund is designated, the provisions of Secton 314 of Public Law 410 apply equally to all three grant programs. Moreover, like other Federal grants, they are intended to implement and extend particular services to insure adequate control of the problem as soon as possible.

With the addition of Federal grant-in-aid funds for tuberculosis control, it has become possible for the first time to correct the outstanding weakness of the earlier programs in the United States; that is, the lack of organized effort and adequate facilities in case finding and follow-up. Although the annual expenditure for maintainance and operation of tuberculosis sanatoria in the United States exceeds $100,000,000, the full usefulness of this great enterprise has not been realized, because the majority of sanatorium admissions represent patients in the more advanced stages of infection. As a consequence, there is abundant opportunity for spread of the disease, and the chances for cure of these patients are considerably diminished. The obvious solution lies in developing a program to get patients under treatment at an earlier, more easily controlled stage.

Therefore, the first grant funds secured from Congress have been employed largely for the establishment of health department services to insure discovery of an increased number of early cases. Such use

of funds has enabled the majority of States to organize large-scale mass chest X-ray service; to employ the use of small film; to provide for follow-up of discovered cases and discharged patients; and to conduct a program of education in cooperation with voluntary agencies.

During the latter part of the fiscal year 1945, $1,370,114 was made available by Congress for grants-in-aid to the States. This relatively modest sum allowed programs in the States to begin. Therefore, when on July 1, 1945, grants-in-aid totaling $5,200,000 became available to the States, full-time organization for tuberculosis control and planned programs of operation existed in nearly all States. To be sure, many of these were merely skeleton organizations but they represented, nevertheless, necessary first steps.

The progress made in the States since the funds became available can be traced by inspecting the recorded developments of the programs. For example, there were, in all of the States, only 21 full-time tuberculosis control officers at the time the Division began operation in July 1944. In other words, more than half of the States had no full-time director and, by inference, no full-time program. Within 15 months of that date, however, 40 of the States had secured full-time directors and had developed actively functioning programs. Developments in other directions have paralleled this increase. Grant-in-aid funds so far available have made possible the addition of approximately 1,000 professional personnel and an equal number in other categories, and approximately 300 X-ray units of varied types have been secured or placed on order.

This represents, of course, the mere beginning of a long-range program. It means that genuine advances have been made in the establishment of adequate case-finding and follow-up services and, to some extent, clinic service for ambulatory patients. However, there is still a shortage of sanatorium beds, especially in certain sections of the country, and this lack will become more apparent as the case-finding program approaches full development. Although case finding of the type contemplated by detecting cases in an earlier stage will modify to some extent the demands of treatment and make certain compromises possible, many more beds must be available if the eradication of tuberculosis is to be effected within a measurable period. It is hoped, therefore, that future programs will include provisions for additional treatment facilities.

Summary

An attempt has been made in this paper to present some of the more important aspects of the Federal assistance program for tuberculosis control administered by the United States Public Health Service. With funds available to the Tuberculosis Control Division, it has been

possible to complete an organization on the national level and to provide general Nation-wide planning. Consultation services, basic research, cooperative projects, and grants-in-aid make it possible for States to establish the machinery necessary for an effectively functioning Nation-wide control program. Grant-in-aid funds have already gone far toward the correction of such outstanding weakness as the lack of adequate case-finding and follow-up facilities. Case finding is well started among the various employee groups and steps have been taken to include all general hospital admissions and out-patients in this program. Since these groups, with their families, constitute a large segment of the Nation's population and since case finding of the type described has proved both successful and practicable, it is not too much to expect that through them, plus other important groups, a majority of the Nation's adult population can be reached within a reasonable period of time. Once case-finding and follow-up facilities have been developed to the fullest possible extent, additional treatment facilities can be provided. However, case finding and medical care and isolation are not enough to insure an effective tuberculosis control program. Rehabilitation and protection of the tuberculous family against economic distress are two other problems which take equal rank with the first two and they must be solved.

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ISOLATION OF *MYCOBACTERIUM TUBERCULOSIS* FROM GASTRIC CONTENTS NEUTRALIZED AFTER VARYING PERIODS [1]

By MARIAN G. SPRICK and JOHN W. TOWEY [2]

Since the examination of gastric contents for *Mycobacterium tuberculosis* has become a recognized procedure in many sanatoria, the question has arisen as to whether there is any correlation between the length of time gastric specimens were allowed to stand before examination and the number of positive results for *M. tuberculosis* obtained. In some places laboratory facilities are available, so there is no delay in the examination of gastric contents. Other institutions, however, must mail the specimens and a delay of 24 to 48 hours occurs before the specimen can be neutralized, animals injected, and cultures made.

[1] Presented at a meeting of the Michigan Trudeau Society, Detroit, Sept. 27, 1945.

[2] From the Michigan Department of Health, Bureau of Laboratories, Powers Division. In cooperation with Pinecrest Sanatorium, Dr. J. W. Towey, Director, Powers, Mich.

Gastric lavages made by private physicians on out-patients also may be delayed before reaching the laboratory.

Over 50 years ago Straus and Wurtz (*1*) found that the gastric juice of dogs would not destroy tubercle bacilli, when exposed from 1 to 6 hours. However, if the organisms were in contact with the gastric juice 8 to 12 hours, only local lesions were produced on animal inoculation. After an exposure of 18 to 36 hours, no lesions were found.

Floyd and Page (*2*) found that when virulent tubercle bacilli were exposed to artificial gastric juice the effect on guinea pigs varied directly with the duration of exposure. After a 12-hour exposure to the artificial gastric juice, the lesions formed in guinea pigs decreased by 80 percent over those found in animals inoculated with tubercle bacilli that had been exposed only 3 hours.

Roper and Ordway (*3*), however, state that the viability of virulent human tubercle bacilli was not affected by free HCl up to $\frac{1}{10}$ normal strength and that the organisms were inhibited only slightly after continuous contact with acid for 40 hours. These workers apparently used acid solutions and not gastric juice.

Other workers, Piasecka-Zeyland (*4*) have found a thermolabile substance in human saliva which inhibits the growth of tubercle bacilli. Since gastric contents may be contaminated with saliva, this substance may have some effect on the results found.

Schwarting (*5*) found that holding untreated gastric specimens at either icebox or incubator temperatures for 24 hours was apt to convert a positive gastric lavage into a false negative one. In her study no tests were carried out at room temperature.

Methods

In this study the following procedure was used. The gastric specimen was brought to the laboratory immediately following aspiration. The volume was noted and the specimen was divided at once into three equal parts. One portion was treated immediately with Hank's (*6*) solution (4 percent sodium hydroxide and 0.2 percent alum). The other two portions were allowed to stand 24 and 48 hours, respectively, at room temperature and then were treated.

After an equal volume of Hank's solution was added to the gastric specimen, it was shaken thoroughly and digested for 30 minutes at 37° in the incubator. From 0.1 to 0.2 ml. of a 0.02-percent solution of Brom thymol blue was added as an indicator, and the mixture was neutralized with 2.5 N HCl. The specimen was transferred to 50-ml. centrifuge tubes and centrifuged at 2,000 r. p. m. for 10 to 15 minutes. The supernatant fluid was decanted and a stained slide preparation of the sediment was made and examined for acid-fast bacilli. One

milliliter of the sediment was inoculated into the inguinal region of a 250–300 gm. guinea pig and 2 ml. was cultured on Lowenstein's and Petragnani's medium. Two slants of each medium were used.

Results

A summary of the results of the repeated examinations on 33 patients from Pinecrest Sanatorium is shown in table 1.

TABLE 1.—*Results with 33 gastric specimens neutralized after varying periods*

Treatment with Hank's solution	Positive pig and/or culture	
	Number	Percent
Immediate	24	73
24-hour	15	45
48-hour	7	21

It will be observed that when the specimens were neutralized immediately, over three times as many positive results were obtained as were found when the specimens were allowed to stand for 48 hours at room temperature before neutralization. Nearly twice as many positives were found on specimens neutralized immediately as on those treated after standing 24 hours. Nine of the thirty-three specimens were negative throughout the series.

In table 2 the results with 25 gastric lavages by stained slide preparation and by guinea pig inoculation or culture are shown.

TABLE 2.—*Results with 25 gastric specimens by stained slide preparation and pig and/or culture*

Treatment with Hank's solution	Gastric specimens		Gastric specimens	
	Stained slide preparation negative	Positive by pig and/or culture	Stained slide preparation positive	Positive by pig and/or culture
Immediate	18	17	7	7
24-hour	18	8	7	7
48-hour	18	3	7	4

There were 18 specimens that were negative for acid-fast organisms on the slide preparation. Seventeen of these specimens were positive for *M. tuberculosis* by culture or guinea pig inoculation after immediate treatment of the specimen, only 8 were positive after 24 hours and only 3 after 48 hours. One specimen was positive after 24 hours but negative after immediate and 48-hour treatment. Apparently, there are some gastric contents in which the inhibitory action of the gastric secretion is weak, as occasional specimens with negative slide preparations are positive by culture or pig after standing 48 hours at room temperature.

It is of interest to note that four specimens in which acid-fast or-

ganisms were found on slide preparation gave positive results in guinea pig and culture after standing 48 hours. However, the other three specimens with positive smears gave positive results with the immediate and 24-hour portions, but not with the 48-hour specimen. This indicated that even though there are relatively many organisms present, some inhibitory effect may occur if specimens are held 48 hours at room temperature.

Comment

Although only a small number of specimens were examined, the results indicate that if gastric specimens are allowed to stand 24 or 48 hours before examination, fewer positive results will be found. In some sanatoria 2- to 5-day pooled gastric contents are examined. If the specimens are allowed to stand without being treated until the series of pooled gastrics is complete, one may question the value of the examination. If pooled specimens are desired, it would seem wise to treat each specimen immediately and then pool them rather than to save the gastric contents for several days before treating.

Whether the effect of the gastric juice on the capacity of the tubercle bacilli to grow is due to a substance found in the saliva, to the acidity of the gastric juice, or possibly to some specific enzyme action has not been determined. Further work is indicated on this problem, as the time interval between treatment and the arrival of specimens in the laboratory assumes importance when gastric specimens are mailed to the laboratory. If the problem is the acidity of the gastric juice, some simple method of neutralizing the specimen before mailing may be worked out.

Summary

1. Thirty-three gastric specimens were studied as to the effect of neutralization immediately, after 24 hours, and after 48 hours.

2. Three times as many positive results were found when specimens were neutralized immediately as at 48 hours and nearly two times as many as after a 24-hour interval.

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Excerpts from

HOW MUCH CONTROL OF TUBERCULOSIS [1]

For the eventual eradication of tuberculosis it is not necessary that transmission be immediately and completely prevented. It is necessary only that the rate of transmission be held permanently below the level at which a given number of infection-spreading (i. e., open) cases succeed in establishing an equivalent number to carry on the succession. If, in successive periods of time, the number of infectious hosts is continuously reduced, the end result of this diminishing ratio, if continued long enough, must be extermination of the tubercle bacillus.

Bearing in mind this principle, it is a fair inference that in this country as a whole we have already reached the stage at which the biological balance is against the survival of the tubercle bacillus, for year by year the mortality from tuberculosis is decreasing. It is true that we do not have equally direct statistical evidence of a proportionate decrease in the prevalence of infective cases, taking into account not only the number of cases but duration of the open stage; but there appears to be no good reason to doubt that the prevalence of open cases is diminishing at something like the same rate as mortality from phthisis. This means that under present conditions of human resistance and environment the tubercle bacillus is losing ground, and that the eventual eradication of tuberculosis requires only that the present balance against it be maintained.

As to maintenance of this balance—favorable to us, unfavorable to the tubercle bacillus—there are, of course, elements of uncertainty, among them uncertainty as to the stability of our civilization. But if it be assumed that environmental control affecting the spread of tubercle bacilli from existing foci can be maintained at its present level (and we may justly expect to improve it), we know of only two forces which singly or together, would check or reverse the downward trend of tuberculosis. These are: (1) a decrease in human resistance to the disease, or (2) some fundamental change in the adaptation of the tubercle bacillus to its host, tending to favor survival of the parasite.

With respect to the latter possibility, we can do no better than base future expectations on past experience. Upon this basis, if we were discussing diphtheria, scarlet fever, or influenza, their past history would lead us to expect future changes, more or less sudden, in the disease-producing properties of their causative organisms. But present knowledge of tuberculosis is consistent with the view that the specific

[1] Frost, Wade Hampton: How Much Control of Tuberculosis. New York, The Commonwealth Fund, 1941.

properties of the tubercle bacillus have not changed appreciably in modern times; and in the absence of compelling evidence for such variation in the past, we are under no necessity of anticipating it in the future. Therefore, while we have no means of excluding this possibility, I do not know of any reason why we should expect it.

A question of more immediate concern is whether, with progressively diminished exposure to tuberculous infection, we must expect such decrease in human resistance to this infection as would check or reverse the present downward trend.

It is probable that one of the most important factors in the decline of tuberculosis has been progressively increasing human resistance, due to the influence of selective mortality and to environmental improvements such as better nutrition and relief from physical stress, tending to raise what may be called nonspecific resistance. It is, however, a reasonable expectation that the increase in average resistance due to these causes will be maintained, for, while complete elimination of the mortality from tuberculosis would check this process of raising genetic resistance, there is no apparent reason why it should result in reversion to a state of higher average susceptibility than exists today. Also, any gains due to better nutrition and to other elements of personal hygiene should be permanent if civilization continues at its present level or a higher one.

The kind of resistance which is of a less permanent order and which seems more likely to be lost, is individual specific immunization by so-called latent infection. At present a majority of the population in many areas acquire their first infection with the tubercle bacillus between late infancy and adolescence, precisely at the age when the immediate reaction to infection is most favorable. However, further reduction in the prevalence of tubercle bacilli in the environment must necessarily postpone first infections to a later average age; and, as it is believed by some authorities that primary infection is more dangerous in adults than in children, it is feared that such postponement of infection will in the end prove disadvantageous.

The question which is thus raised cannot at present be answered with assurance. We do not yet know enough about the nature and durability of any immunity which may be conferred by infection acquired in childhood. It is, however, significant that in those areas where childhood infection is most common, we find the highest mortality in adult life; and that in areas such as Cattaraugus County, N. Y., where a majority of adolescents are demonstrably tuberculin negative, the mortality in adult life is low. Also, occupational statistics show that in adult life the mortality from tuberculosis is lowest in the professional group who, as a class, have been least exposed to infection

in childhood. Therefore, while this whole question obviously needs much more study, there is at present no compelling evidence that the downward course of tuberculosis must be checked by eventual loss of mass immunity.

We need not assume, then, that tuberculosis is permanently and ineradicably engrafted upon our civilization. On the contrary, the evidence indicates that in this country the balance is already against the survival of the tubercle bacillus; and we may reasonably expect that the disease will eventually be eradicated. There can be no certainty of this result, but it is an expectation sufficiently well grounded to justify shaping our tuberculosis control program toward this definite end.

A FORECAST [1]

"Much has been accomplished but much remains to be done. Sixty thousand lives a year even now are taken by the tubercle bacillus. The goal of eradication can now be visualized in the distance. In the four decades since 1900, when the death rate was 202 per hundred thousand, the reduction in mortality from tuberculosis in the United States was 20 per cent in the first, 22 per cent in the second, 33 percent in the third, and 34 per cent in the fourth. We may assume, therefore, that this average decline of the last two decades can be maintained. Since the tuberculosis death rate was 45 in 1940, we may assume that it would be 32 in 1950; 21 in 1960; 14 in 1970; forty years from now in 1980 a rate of 10 may be anticipated. The bells that ring in the year 2000 may sound the death knell of the tubercle bacillus.

"The ultimate surrender of the tubercle bacillus, therefore, is at least two generations away unless new developments in treatment come to our aid. Let us hope that this surrender may be brought about more quickly by discoveries made in the fields of chemotherapy and nutrition. Research in both of these fields has yielded rich returns in recent years. But without waiting for new discoveries, let us make full use of the knowledge we have. This would mean intensifying case finding activities and concentrating them on the groups having the highest incidence of tuberculosis and treating the cases when found. To do this, more hospital beds are needed in many States and we should wage an active campaign to obtain them."

[1] Chadwick, Henry D., and Pope, Alton S.: The Modern Attack on Tuberculosis. New York, The Commonwealth Fund, 1942, p. 85.

PREVALENCE OF DISEASE

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

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED APRIL 13, 1946

Summary

Of 12 cases of smallpox reported for the week for the country as a whole, 8 occurred in Washington. For the year to date, 149 cases have been reported, as compared with 160 for the corresponding period last year and a 5-year (1941–45) median of 343. (See p. 662.)

A total of 40,746 cases of measles was reported for the week (exceeded only once in a corresponding week of the past 10 years—in 1941), as compared with 38,233 last week and a 5-year median of 27,161. An aggregate of 23,045 cases (about 57 percent of the total, as compared with 53 percent in the same area last week) was reported in the Middle Atlantic and East North Central areas. The total to date is 301,196, as compared with 40,379 and 437,994, respectively, in the corresponding periods of 1945 and 1941, the years of lowest and highest incidence for the corresponding periods of the past 5 years. The 5-year median is 262,946.

The total of 316 cases of diphtheria reported, as compared with 314 last week and a 5-year median of 243, is more than reported for a corresponding week since 1938. Pennsylvania reported the largest increase—from 19 to 29 cases. Only 3 other States reported more than 15 cases each—New York (36), Ohio (24), and Texas (34). The total for the year to date, 5,568 cases, is more than reported for the corresponding period of any other year since 1939.

Of the total of 29 cases of poliomyelitis, as compared with 28 last week and a 5-year median of 19, Texas reported 6, New York 4, and California 3. The total to date since the week ended March 16, the lowest weekly incidence so far this year, is 109, as compared with 124 for the corresponding period last year.

A total of 131 cases of meningococcus meningitis was reported, as compared with 158 last week and a 5-year median of 194. The largest numbers were reported in New York (14), Pennsylvania (13), and New Jersey and Illinois (10 each).

Deaths recorded for the week in 93 large cities of the United States totaled 9,105, as compared with 9,037 last week, and 9,154 and 9,572 for the corresponding weeks of 1945 and 1944, respectively, and a 3-year (1943–45) average of 9,528. The total to date is 150,718, as compared with 144,518 for the corresponding period last year.

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Telegraphic morbidity reports from State health officers for the week ended Apr. 13, 1946, and comparison with corresponding week of 1945 and 5-year median

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

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1941–45	Week ended—		Median 1941–45	Week ended—		Median 1941–45	Week ended—		Median 1941–45
	Apr. 13, 1946	Apr. 14, 1945		Apr. 13, 1946	Apr. 14, 1945		Apr. 13, 1946	Apr. 14, 1945		Apr. 13, 1946	Apr. 14, 1945	
NEW ENGLAND												
Maine	4	0	0	-------	-------	2	91	1	56	0	0	5
New Hampshire	0	0	0	1	-------	-------	125	1	27	1	0	0
Vermont	0	1	0	-------	-------	-------	11	8	100	0	0	0
Massachusetts	3	9	4	-------	-------	-------	1,816	203	1,013	2	8	5
Rhode Island	0	0	0	1	43	1	12	7	14	0	1	1
Connecticut	1	2	0	-------	7	3	247	123	430	3	0	2
MIDDLE ATLANTIC												
New York	36	14	19	[1] 1	[1] 1	[1] 14	5,894	77	2,317	14	17	17
New Jersey	6	6	4	1	6	7	3,976	49	1,831	10	3	4
Pennsylvania	29	10	12	2	3	2	3,409	238	1,264	13	13	13
EAST NORTH CENTRAL												
Ohio	24	18	6	5	11	14	916	36	1,183	3	9	9
Indiana	12	2	3	5	1	7	768	14	224	5	4	4
Illinois	15	3	17	4	2	30	1,352	126	1,281	10	17	13
Michigan [2]	9	18	8	-------	-------	3	2,508	135	812	4	5	5
Wisconsin	2	0	1	36	10	37	4,222	52	1,622	4	2	2
WEST NORTH CENTRAL												
Minnesota	7	1	1	-------	-------	1	53	14	153	3	7	2
Iowa	5	4	4	-------	-------	-------	148	39	301	2	6	2
Missouri	4	5	3	3	1	2	73	21	392	1	5	6
North Dakota	2	0	1	-------	-------	6	8	5	55	0	0	0
South Dakota	1	4	2	-------	-------	-------	38	36	36	0	2	0
Nebraska	0	2	1	3	1	1	579	26	166	0	2	0
Kansas	3	2	2	5	-------	4	693	54	623	1	3	3
SOUTH ATLANTIC												
Delaware	0	1	0	-------	-------	-------	29	3	13	1	0	1
Maryland [2]	8	6	4	1	3	9	567	62	215	2	10	10
District of Columbia	0	0	0	1	2	1	212	4	83	0	1	2
Virginia	4	4	4	114	123	274	771	55	488	5	8	8
West Virginia	8	3	3	2	12	9	123	73	159	1	2	2
North Carolina	9	2	6	-------	-------	3	623	31	1130	2	8	8
South Carolina	5	7	4	292	195	408	427	28	251	0	2	1
Georgia	0	1	3	5	8	48	216	16	299	3	4	4
Florida	4	3	3	2	-------	16	139	9	297	3	0	0
EAST SOUTH CENTRAL												
Kentucky	6	3	4	45	1	4	430	26	126	3	7	7
Tennessee	5	1	3	27	26	49	286	11	293	1	2	2
Alabama	7	8	8	11	38	108	235	25	243	4	2	6
Mississippi [2]	6	5	5	-------	-------	-------	-------	-------	-------	3	1	8
WEST SOUTH CENTRAL												
Arkansas	3	1	2	35	42	42	229	44	193	2	2	2
Louisiana	4	2	5	15	16	16	102	37	163	1	2	2
Oklahoma	0	2	3	69	79	79	344	27	136	2	1	1
Texas	34	35	29	635	778	778	2,107	535	2,197	9	6	7
MOUNTAIN												
Montana	4	0	1	4	2	2	123	17	106	0	0	0
Idaho	0	0	0	8	1	1	122	3	67	0	0	0
Wyoming	0	1	0	-------	-------	-------	60	13	79	0	1	1
Colorado	4	2	4	20	4	25	890	38	279	0	0	1
New Mexico	1	3	1	1	-------	2	24	16	65	0	0	0
Arizona	15	1	1	78	54	100	258	13	77	1	0	0
Utah [2]	0	0	0	3	2	2	555	164	164	1	0	0
Nevada	0	0	0	-------	-------	-------	11	4	16	0	0	0
PACIFIC												
Washington	7	18	4	-------	2	3	786	58	133	2	3	3
Oregon	7	12	3	2	13	13	315	66	203	1	6	1
California	12	22	13	29	20	71	3,823	1,536	1,536	8	22	22
Total	316	244	243	1,466	1,507	2,668	40,746	4,179	27,161	131	194	194
15 weeks	5,568	4,478	4,370	179,321	54,658	67,152	301,196	40,379	262,946	2,837	3,617	3,617

[1] New York City only.

[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended Apr. 13, 1946, and comparison with corresponding week of 1945 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [2]		
	Week ended—		Median 1941–45	Week ended—		Median 1941–45	Week ended—		Median 1941–45	Week ended—		Median 1941–45
	Apr. 13, 1946	Apr. 14, 1945		Apr. 13, 1946	Apr. 14, 1945		Apr. 13, 1946	Apr. 14, 1945		Apr. 13, 1946	Apr. 14, 1945	
NEW ENGLAND												
Maine	1	0	0	34	41	15	0	0	0	1	0	1
New Hampshire	0	0	0	8	15	8	0	0	0	0	0	0
Vermont	0	0	0	12	7	7	0	0	0	0	0	0
Massachusetts	0	0	0	202	366	450	0	0	0	1	1	1
Rhode Island	0	0	0	22	45	15	0	0	0	0	0	0
Connecticut	0	0	0	70	71	71	0	0	0	2	0	0
MIDDLE ATLANTIC												
New York	4	9	2	912	522	535	0	0	0	0	3	4
New Jersey	2	1	0	190	133	167	0	0	0	1	0	0
Pennsylvania	1	2	1	405	578	420	0	0	0	4	4	5
EAST NORTH CENTRAL												
Ohio	0	0	0	401	262	296	1	0	1	0	1	1
Indiana	1	0	0	83	105	122	1	3	1	0	3	1
Illinois	1	1	0	203	284	284	0	2	2	0	2	4
Michigan [3]	0	4	0	160	238	238	0	0	0	4	0	1
Wisconsin	0	1	1	134	168	168	0	0	0	3	0	0
WEST NORTH CENTRAL												
Minnesota	0	0	0	62	87	76	0	0	0	0	0	0
Iowa	1	0	0	50	60	57	0	1	1	0	0	0
Missouri	0	0	0	56	47	116	0	0	2	0	0	0
North Dakota	0	0	0	8	39	22	0	0	0	0	0	0
South Dakota	0	0	0	6	20	20	0	0	0	0	0	0
Nebraska	0	1	0	38	58	36	2	0	0	0	0	0
Kansas	1	0	0	72	82	82	0	1	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	7	13	19	0	0	0	1	0	0
Maryland [3]	0	0	0	83	173	148	0	0	0	1	0	0
District of Columbia	0	0	0	24	28	18	0	0	0	1	0	0
Virginia	0	0	0	85	82	39	0	0	0	1	0	1
West Virginia	0	0	0	39	42	38	0	0	0	0	0	4
North Carolina	0	0	0	37	63	39	0	0	0	0	3	2
South Carolina	0	0	0	8	7	4	0	0	0	0	1	1
Georgia	0	0	0	8	23	17	0	0	0	1	4	3
Florida	2	1	0	3	10	8	0	0	0	1	1	1
EAST SOUTH CENTRAL												
Kentucky	0	0	1	19	45	73	0	0	0	2	4	4
Tennessee	0	2	1	25	27	44	0	0	0	1	8	1
Alabama	0	9	1	65	16	16	0	0	0	0	2	1
Mississippi [3]	1	0	0	4	13	10	0	0	0	3	0	1
WEST SOUTH CENTRAL												
Arkansas	2	0	0	5	10	7	0	1	3	0	3	1
Louisiana	2	0	0	7	13	8	0	0	0	3	3	4
Oklahoma	0	1	0	16	9	16	0	1	1	0	0	0
Texas	6	3	2	29	91	63	0	1	1	11	7	6
MOUNTAIN												
Montana	0	0	0	17	15	20	0	0	0	0	0	0
Idaho	0	0	0	12	28	28	0	0	0	1	0	0
Wyoming	0	0	0	7	41	22	0	0	0	0	0	0
Colorado	0	0	0	23	45	45	0	0	0	1	0	0
New Mexico	0	0	1	9	17	10	0	0	0	1	1	1
Arizona	0	0	0	13	35	11	*0	0	0	2	2	0
Utah [3]	0	0	0	35	30	30	0	0	0	0	0	0
Nevada	0	0	0	0	0	4	0	0	0	0	0	0
PACIFIC												
Washington	1	0	0	30	71	44	8	0	0	0	0	0
Oregon	0	0	0	32	41	38	0	0	0	0	0	1
California	3	1	2	201	444	192	0	0	0	2	0	2
Total	29	36	19	3,971	4,660	4,483	12	10	21	49	53	67
15 weeks	575	521	371	52,463	83,891	59,767	*149	160	343	683	834	1,078

[2] Period ended earlier than Saturday.

[3] Including paratyphoid fever reported separately, as follows: Connecticut 2; New Jersey 1; Michigan 1; Georgia 1; Tennessee 1; Colorado 1.

*Correction: Arizona, week ended Mar. 30, smallpox 0 (instead of 1 case).

Telegraphic morbidity reports from State health officers for the week ended Apr. 13, 1946, and comparison with corresponding week of 1945 and 5-year median—Con.

Division and State	Whooping cough			Week ended Apr. 13, 1946							
	Week ended—		Median 1941–45	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Apr. 13, 1946	Apr. 14, 1945		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	17	22	22								
New Hampshire	1										
Vermont	32	19	15								4
Massachusetts		151	151		1		1				1
Rhode Island	18	29	26								
Connecticut	45	76	40	2							
MIDDLE ATLANTIC											
New York	163	219	283	5	35		2		1		
New Jersey	124	121	121		1	2					1
Pennsylvania	111	161	163		1		1				1
EAST NORTH CENTRAL											
Ohio	71	133	187			1					4
Indiana	35	9	23			1					
Illinois	75	39	76	3							2
Michigan [2]	93	59	135	3	1						7
Wisconsin	104	53	88								6
WEST NORTH CENTRAL											
Minnesota	9	8	30	2			1				3
Iowa	11	3	17	1							1
Missouri		11	18								
North Dakota	6	1	7								
South Dakota		3	2								
Nebraska		2	11								
Kansas	15	28	63	2							6
SOUTH ATLANTIC											
Delaware		1	1						2		
Maryland [2]	19	66	64			1	1		1		1
District of Columbia	4	8	18								
Virginia	27	157	125			52			1		1
West Virginia	20	26	39								1
North Carolina	92	94	105	1	1				1	1	
South Carolina	79	93	89	1	5					1	
Georgia	35	21	21	2					4	6	1
Florida	4	24	17	2						8	1
EAST SOUTH CENTRAL											
Kentucky	57	34	40		2						
Tennessee	31	20	29				1				1
Alabama	4	17	48							4	
Mississippi [2]									4	1	2
WEST SOUTH CENTRAL											
Arkansas	7	8	11						1	2	3
Louisiana		3	8	1						2	1
Oklahoma	9	10	16								
Texas	182	351	337	19	209	13			1	13	16
MOUNTAIN											
Montana		2	12						1		
Idaho	6	3	3								
Wyoming	10	2	2					4			1
Colorado	40	15	39								2
New Mexico	2	1	19								
Arizona	14	33	26			22					
Utah [2]	34	18	58								
Nevada			4								
PACIFIC											
Washington	27	9	50								1
Oregon	19	10	18								2
California	51	378	378	1	5						2
Total	1,703	2,551	3,645	45	261	92	7	4	17	38	73
Same week, 1945	2,551			13	310	56	7	2	11	26	103
Average, 1943–45	2,818			24	245	64	10	[4] 4	12	[4] 26	
15 weeks: 1946	27,101			562	4,252	1,547	119	10	294	692	1,134
1945	36,627			417	6,783	1,771	106	6	267	727	1,287
Average, 1943–45	41,344		[4] 57,746	417	4,271	1,133	141	[4] 7	225	[4] 586	

[2] Period ended earlier than Saturday.
[4] 5-year median, 1941–45.

WEEKLY REPORTS FROM CITIES

City reports for week ended Apr. 6, 1946

This table lists the reports from 84 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	1	0	------	0	-----	0	2	0	6	0	0	8
New Hampshire:												
Concord	0	0	------	0	------	1	1	0	2	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	1	0	0	------
Massachusetts:												
Boston	3	0	------	0	423	1	4	0	59	0	0	19
Fall River	0	0	------	0	40	0	2	0	3	0	0	1
Springfield	0	0	------	0	24	0	0	0	1	0	1	1
Worcester	0	0	-----	0	198	0	7	0	3	0	0	15
Rhode Island:												
Providence	0	0	2	0	------	0	0	0	2	0	0	22
Connecticut:												
Bridgeport	0	0	1	1	------	0	0	0	6	0	0	2
Hartford	0	0	------	0	2	0	0	1	2	0	0	2
New Haven	0	0	------	0	48	0	3	0	5	0	0	------
MIDDLE ATLANTIC												
New York:												
Buffalo	3	0	------	0	268	1	5	0	8	0	0	18
New York	24	0	------	1	1,385	23	47	1	475	0	2	27
Rochester	0	0	------	0	704	0	3	0	19	0	0	4
Syracuse	0	0	------	0	98	0	1	0	6	0	0	5
New Jersey:												
Camden	1	0	----	0	64	0	3	0	6	0	0	3
Newark	0	0	------	0	1,110	0	1	0	17	0	0	11
Trenton	0	0	------	0	13	0	1	0	4	0	0	2
Pennsylvania:												
Philadelphia	1	0	2	1	816	2	18	0	73	0	1	29
Pittsburgh	0	0	3	0	8	2	14	0	33	0	0	3
Reading	0	0	----	0	315	0	2	0	6	0	0	17
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	112	1	5	0	12	0	0	1
Cleveland	0	0	------	1	44	2	3	0	33	0	0	24
Columbus	5	0	------	0	4	0	1	0	16	0	0	1
Indiana:												
South Bend	0	0	------	0	3	0	0		5	0	0	------
Terre Haute	1	0	------	0	41	0	2	0	1	0	0	1
Illinois:												
Chicago	0	0	2	2	537	8	30	0	76	0	0	58
Michigan:												
Detroit	1	0	------	0	1,043	2	16	0	55	0	2	38
Flint	0	0	------	0	8	0	2	0	5	0	0	------
Grand Rapids	0	0	------	0	139	1	0	0	8	0	0	13
Wisconsin:												
Kenosha	0	0	------	0	1	0	0	0	1	0	0	------
Milwaukee	0	0	1	1	1,497	1	2	0	28	0	0	60
Racine	0	0	------	0	10	0	0	0	4	0	0	----
Superior	0	0	------	0	------	0	0	0	0	0	0	3
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	9	0	1	0	1	0	0	1
Minneapolis	4	0	------	1	14	2	5	0	12	0	0	1
Missouri:												
Kansas City	1	0	------	1	49	0	6	0	11	0	0	2
St. Louis	3	0	1	0	106	1	13	0	14	0	0	1

City reports for week ended Apr. 6, 1946—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza cases	Influenza deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	1	0	------	0	61	0	2	0	6	0	0	------
Kansas:												
Topeka	0	0	------	0	24	0	4	0	11	0	0	------
Wichita	0	0	------	0	63	0	2	0	7	0	0	------
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	24	0	3	0	3	0	0	1
Maryland:												
Baltimore	17	0	2	1	413	0	6	0	38	0	0	13
Cumberland	0	0	------	0	1	0	0	0	11	0	0	------
Frederick	0	0	------	0	-------	0	0	0	0	0	0	------
District of Columbia:												
Washington	0	0	------	0	285	1	5	0	24	0	0	6
Virginia:												
Lynchburg	0	0	------	0	17	0	1	0	3	0	0	------
Richmond	0	0	------	0	14	0	0	0	5	0	0	------
Roanoke	0	0	------	0	15	0	0	0	3	0	0	2
West Virginia:												
Charleston	0	0	------	0	2	0	0	0	1	0	0	------
Wheeling	1	0	------	0	3	0	3	0	1	0	0	30
North Carolina:												
Raleigh	0	0	------	0	74	0	2	0	0	0	0	2
Wilmington	0	0	------	0	21	0	3	0	0	0	0	------
Winston-Salem	0	0	------	0	18	0	2	0	1	0	0	21
South Carolina:												
Charleston	0	0	------	0	22	0	0	0	0	0	0	------
Georgia:												
Atlanta	0	0	------	0	8	1	3	0	4	0	0	------
Brunswick	0	0	------	0	3	0	0	0	0	0	0	------
Savannah	0	0	------	0	1	0	2	0	0	0	0	------
Florida:												
Tampa	1	0	------	0	37	1	1	0	3	0	0	3
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	1	46	0	15	0	5	0	0	10
Nashville	0	0	------	0	17	0	1	0	0	0	0	------
Alabama:												
Birmingham	0	0	------	0	5	0	4	0	0	0	0	------
Mobile	1	0	2	3	6	1	1	1	0	0	3	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	4	0	13	0	0	0	3	0	0	------
Louisiana:												
New Orleans	1	0	------	0	15	1	5	0	8	0	0	------
Shreveport	0	0	------	0	-------	0	3	0	0	0	1	------
Texas:												
Dallas	1	0	------	0	29	1	5	1	3	0	0	------
Galveston	0	0	------	0	7	0	1	0	0	0	0	------
Houston	1	0	------	0	16	3	4	0	1	0	5	------
San Antonio	2	0	1	0	64	0	8	0	0	0	1	3
MOUNTAIN												
Montana:												
Billings	0	0	------	0	-------	0	0	0	1	0	0	------
Great Falls	0	0	------	0	4	0	2	0	1	0	0	------
Helena	0	0	------	0	-------	0	0	0	0	0	0	------
Missoula	0	0	------	0	-------	0	0	0	0	0	0	------
Idaho:												
Boise	0	0	------	0	-------	0	1	0	0	0	0	------
Colorado:												
Denver	3	0	2	0	651	0	2	1	10	1	1	16
Pueblo	0	0	------	0	31	0	1	0	1	0	0	6
Utah:												
Salt Lake City	0	0	------	1	133	0	2	0	4	0	0	6

City reports for week ended Apr. 6, 1946—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	2	0	------	0	148	0	5	0	5	4	0	8
Spokane	0	0	------	0	123	0	2	0	1	0	0	------
Tacoma	0	0	------	0	10	0	0	0	6	0	0	3
California:												
Los Angeles	1	0	13	0	520	2	3	0	64	0	0	11
Sacramento	1	0	1	1	298	0	3	0	1	0	0	3
San Francisco	0	0	5	1	519	2	10	0	21	0	1	5
Total	81	0	42	17	12,894	61	317	5	1,275	5	18	542
Corresponding week, 1945	66	------	55	19	1,028	------	339	------	1,497	0	5	512
Average, 1941–45	61	------	128	[1] 31	[2] 7,118	------	[1] 425	------	1,701	1	12	838

[1] 3-year average, 1943–45.
[2] 5-year median, 1941–45.

Anthrax.—Cases: Philadelphia 2.
Dysentry, amebic.—Cases: New York 2; Chicago 2; San Francisco 1.
Dysentry, bacillary.—Cases: New York 5; Chicago 2; Baltimore 3; Los Angeles 1.
Dysentry, unspecified.—Cases: Baltimore 1; San Antonio 12.
Typhus fever, endemic.—Cases: Tampa 2; San Antonio 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 84 cities in the preceding table (estimated population, 1943, 33,422,000)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	10.5	0.0	7.8	2.6	1,921	5.2	49.7	2.6	235	0.0	2.6	183
Middle Atlantic	13.4	0.0	2.3	0.9	2,213	13.0	44.0	0.5	299	0.0	1.4	55
East North Central	4.6	0.0	2.0	2.6	2,248	9.8	40.0	0.0	160	0.0	1.3	130
West North Central	20.9	0.0	2.3	4.6	756	7.0	76.5	0.0	144	0.0	0.0	12
South Atlantic	31.1	0.0	3.3	1.6	1,566	4.9	50.7	0.0	159	0.0	0.0	127
East South Central	5.9	0.0	11.8	23.6	437	5.9	123.9	5.9	30	0.0	17.7	59
West South Central	14.3	0.0	14.3	0.0	413	14.3	74.6	2.9	43	0.0	20.1	19
Mountain	23.8	0.0	15.9	7.9	6,505	0.0	63.5	7.9	135	7.9	7.9	222
Pacific	6.3	0.0	30.0	3.2	2,559	6.3	36.4	0.0	155	6.3	1.6	47
Total	12.7	0.0	6.6	2.7	2,017	9.5	49.6	0.8	199	0.8	2.8	85

PLAGUE INFECTION IN SAN BENITO, SAN LUIS OBISPO, AND VENTURA COUNTIES, CALIF.

Under dates of April 1, 2, and 12, 1946, plague infection has been reported proved in specimens of tissue and fleas from rodents in California as follows:

San Luis Obispo County.—In tissue from a squirrel, species not stated, found dead about 1 mile north of Pozo, in the northeast quarter of section 16, township 30, south range 15 E., received at laboratory March 1 and proved positive March 22.

San Benito County.—In a pool of organs from 7 field mice, *Microtus* sp., trapped 7 miles east and 5 miles south of Tres Pinos, proved positive March 15; in a pool of 207 fleas from 4 ground squirrels, *C. beecheyi*, found dead 5 miles east of Tres Pinos, proved positive March 25.

Ventura County.—In tissue from 1 rat, *R. norvegicus*, taken 2 miles east of Santa Paula, proved positive April 7.

SMALLPOX IN SAN FRANCISCO, CALIF., AND SEATTLE, WASH.

Up to April 17 no new cases of smallpox had been reported in San Francisco since March 27, the date of onset of the latest reported local case. A total of 9 cases has been reported in the city—3 with origin outside the United States and 6 with origin within the city. In addition, 4 cases have been reported as arriving on two transports in the San Francisco area, and 1 case in a member of the Armed Services arriving at Camp Beale (Marysville) on April 6. This patient left Yokohama on March 21, and arrived at Seattle on April 4. Onset of prodromes reported on April 5, appearance of rash on April 6. Also one case of smallpox of local origin has been reported in San Diego.

Up to April 15, 38 cases of smallpox, with 10 deaths, had been reported in the Seattle-King County area, Washington, and 3 cases outside (1 each in Longview, Friday Harbor, and Waterville, not associated with the Seattle cases)—a total of 41 cases and 10 deaths. Of the deaths, 8 were reported as definitely due to smallpox, 1 was in a person with a long-standing illness upon which was superimposed a very mild varioloid, and 1 was a case of fulminating illness suspected of being hemorrhagic smallpox.

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DEATHS DURING WEEK ENDED APRIL 6, 1946

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

	Week ended April 6, 1946	Corresponding week, 1945
Data for 93 large cities of the United States:		
Total deaths	9,037	9,121
Average for 3 prior years	9,367	
Total deaths, first 14 weeks of year	141,698	135,364
Deaths under 1 year of age	605	587
Average for 3 prior years	617	
Deaths under 1 year of age, first 14 weeks of year	8,483	8,955
Data from industrial insurance companies:		
Policies in force	67,196,295	67,188,314
Number of death claims	13,151	15,492
Death claims per 1,000 policies in force, annual rate	10.2	12.0
Death claims per 1,000 policies, first 14 weeks of year, annual rate	11.2	11.0

FOREIGN REPORTS

CANADA

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

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		3		65	212	24	17	31	79	431
Diphtheria		2	1	16	6	2	1	2		30
German measles				26	27		2	10	11	76
Influenza		27			42	29			31	129
Measles		206	6	658	1,461	11	4	47	69	2,462
Meningitis, meningococcus					3					3
Mumps				144	336	111	11	50	149	801
Poliomyelitis					2					2
Scarlet fever		9	5	66	76	18	2	10	15	201
Tuberculosis (all forms)		2	9	92	53	22	4	27	60	269
Typhoid and paratyphoid fever				9	7		4	1	1	22
Undulant fever					3					3
Venereal diseases:										
Gonorrhea		22	12	72	172	63	56	47	76	520
Syphilis		22	6	134	110	13	20	13	37	355
Whooping cough				66	58			6		130

CUBA

Habana—Communicable diseases—4 weeks ended March 30, 1946.—During the 4 weeks ended March 30, 1946, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	1		Measles	1	
Chickenpox	10		Tuberculosis	6	1
Diphtheria	17		Typhoid fever	30	4
Malaria	1				

MADAGASCAR

Notifiable diseases—Year 1945.—During the year 1945, cases of certain notifiable diseases were reported in Madagascar and its dependencies as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	417	Poliomyelitis	4
Diphtheria	52	Recurrent fever	2
Dysentery, unspecified	176	Scarlet fever	1
Leprosy	79	Trachoma	15
Measles	477	Typhoid fever	491
Plague	184		

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

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

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

Cholera

China.—Cholera has been reported in China as follows: Canton, March 1–20, 1946, 31 cases, 2 deaths; Fukien Province, March 26, 1 case; Hupeh Province, March 1–20, 1946, 28 cases, 4 deaths.

Plague

China—Fukien Province—Loyuan.—On March 25, 1946, 1 case of plague was reported in Loyuan, Fukien Province, China.

Manchuria.—Plague has been reported in Manchuria as follows: Week ended March 16, 1946, 8 deaths from pneumonic plague in Liaopeh Province; for the period February 26 to March 15, 1946, 19 deaths were reported in Mukden.

Smallpox

British East Africa—Tanganyika.—For the week ended March 9, 1946, 350 cases of smallpox with 52 deaths were reported in Tanganyika, British East Africa. These figures include delayed reports.

Typhus Fever

Bulgaria.—For the week ended March 16, 1946, 64 cases of typhus fever were reported in Bulgaria.

Egypt.—Typhus fever has been reported in all of Egypt as follows: Weeks ended—March 9, 1946, 41 cases, 9 deaths, March 16, 1946, 71 cases.

Tunisia.—Typhus fever has been reported in Tunisia as follows: March 1–10, 1946, 22 cases; March 11–20, 1946, 23 cases.

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