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Community-Wide Chest X-ray Survey, IV. Diagnostic Clinic

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EDITOR'S NOTE. Since tuberculosis is first a medical problem, any organized procedure aimed at finding the disease is essentially a medical program. Consequently, all physicians—whether they be in private practice or in public health, or whether they be general practitioners or specialists—invariably have primary responsibility for the conduct of such a program. In a community-wide chest X-ray survey, there are many activities which engage the interest and attention of physicians. These include the entire range of medical activities which enter into this kind of enterprise: over-all planning, including the development of medical policies and procedures to govern the survey—policies and procedures, for example, on film interpretation, diagnosis, follow-up, and disposition—and the development of working relationships among local medical societies, departments of health, and voluntary health agencies; taking and interpreting the screening films and the conventional 14" x 17" roentgenograms; diagnostic work-up and differentiation of abnormalities revealed by the chest films; disposition of the cases of significant disease found in the chest survey; and finally, long-term follow-up. In addition, the medical profession of the community has over all responsibility for administration, and for exploiting opportunities for professional information and education which a survey provides in abundance.

In the Denver chest X-ray survey, which was conducted in 1949, the physicians of that community chose the device of a diagnostic center to accomplish the diagnosis and disposition of suspects discovered during the course of the screening program. The center represented one of the principal areas of medical participation in the survey. Because of special interest in this device, we are, this month, presenting a detailed account of the organization and operation of that center.

In any community-wide chest X-ray survey, the small-film radiographic examination is but the first step in the case-finding process. It is, indeed, merely a screening operation, serving to separate persons with definitely or suspiciously abnormal X-ray shadows from those with no suggestion of chest abnormality.

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Obviously, an abnormal finding in the initial X-ray film cannot by itself constitute a clinical diagnosis. Nevertheless, it does serve to focus attention on those persons in need of further study. At the same time, such a photofluorographic finding imposes an obligation on the physician and the official health agency—an obligation to carry out full diagnostic study promptly in order to determine the clinical significance of the suspected abnormality. For, the abnormal findings discernible in an initial screening film can range all the way from minor deviations requiring no follow-up or care to some very serious conditions which demand immediate medical attention.

It is entirely unrealistic to expect all or even a majority of persons who have been notified of suspicious X-ray shadows to follow through themselves on the elaboration of these findings. Often, a patient may delay or even neglect seeking necessary medical advice, especially when he has no apparent symptoms. Since most of the significant screening-film abnormalities are found among persons without apparent symptoms, the implications of failure to follow-up the suspicious X-ray findings are only too evident. Prompt clinical evaluation is vital, both from the public health and personal points of view.

There is no doubt, moreover, that the cautious interpretation of screening films does result in some over-reading and in the misclassification of some persons as "suspects." In actual fact, many of these cases will be removed from the "suspect" category and relieved of needless anxiety on the basis of a 14″ x 17″ X-ray film alone. Others will require more extensive diagnostic work-up to clarify the significance of the suspicious finding observed in the screening film. In any case, prompt diagnostic evaluation is of the greatest importance, whether the "suspect" proves to be negative or whether he is actually found to have significant disease.

From the standpoint of the private physician, diagnostic studies carried out as part of a chest X-ray survey offer the great advantage of providing a certain amount of concrete information concerning his patient's condition, rather than an ill-defined suspicion of an abnormality noted on the screening film. In many instances, the physician might otherwise find it difficult and time-consuming to obtain the necessary diagnostic studies himself. Not infrequently, the patient may be unwilling or unable to follow the physician's advice concerning further diagnostic work-up because of financial considerations. All this is likely to result in loss of valuable time, to the patient's detriment.

For the official health agency, the matter of speedy diagnostic evaluation is of particular urgency. The community agency is most directly and profoundly affected by a chest X-ray screening program because of the number of new cases of tuberculosis discovered by the survey. If the resources of the health department are to be used

most profitably, tuberculosis case registers must not be overloaded with large numbers of "suspects" whose follow-up will produce findings of little or no public health significance. Here again, there can be no substitute for prompt and full diagnostic study.

Finally, the community aspect of the problem deserves particular consideration, since the discovery of the active and infectious case of tuberculosis is one of the chief objectives of the survey program. The prompt and accurate identification of these cases through adequate diagnostic study is the first step in providing isolation and care, and, thus, in removing the potential foci of infection. Since hospital facilities—the means for the accomplishment of this objective—are quite often limited, discrimination and clinical judgment must be exercised to determine priorities for institutional treatment; without full clinical, radiological, and bacteriological information on which to base such determinations, the best interests of the community's health and its protection against tuberculous infection cannot properly be served.

In the Denver and Tri-County Chest X-ray Survey of 1949, these were the considerations which motivated the establishment of a special diagnostic clinic as an integral part of the survey organization. To those responsible for the formulation of basic medical policies and procedures, a properly organized and adequately staffed and equipped diagnostic center seemed to offer the best assurance of attaining the survey's stated objectives: the discovery of all cases of tuberculosis within the surveyed communities. Accordingly, at the recommendation of the survey's medical committee and with the approval of the county medical societies, a diagnostic center was set up as part of the program's organization. The center, however, was kept separate and apart from existing public health clinic facilities.

Organization of the Center

It was apparent that there were no ready facilities in existence in the community to meet the anticipated needs. It was clear that the case load which could be expected to result from a survey of these proportions would be so great that it would require an unusual concentration of effort for a limited period of time. It was therefore necessary to set in motion an improvised organization with the aid of available resources in the community; to recruit an ad hoc staff, including medical, nursing, and other auxiliary personnel; and to provide other facilities and equipment essential for efficient operation.

The diagnostic center was set up as one of the units of the survey organization, and its operation closely integrated with the promotional, community participation, technical, and professional activities of the survey. Both professional and volunteer members of the survey

staff were fully informed of the basic aims and functions of the diagnostic center so that they in turn could interpret them to the public.

A close working relationship was set up between the staff of the diagnostic center and the survey team. Public Health Service medical officers assigned to the survey team engaged in periodic conferences with the center's medical staff to discuss policies and practices and to review the 14″ x 17″ films of persons recalled for further study. This was of considerable value in providing some continuity in the diagnostic evaluation and disposition of the cases.

Quarters and Equipment

The diagnostic center was housed in the former communicable disease unit of Denver General Hospital, which was made available by the Denver Bureau of Health and Hospitals. It adjoined the general headquarters and record center of the survey organization and was conveniently located from the standpoint of transportation and general accessibility. Only minor alterations of the building were required to make it suitable for the purposes of the center.

Equipment for the center was obtained from a variety of sources. The radiographic unit and darkroom equipment for 14″ x 17″ films were provided by the Public Health Service. A fluoroscopic unit, X-ray film illuminators, and other equipment, as well as office furniture, were obtained on loan from a number of the sponsoring agencies, other community organizations, and commercial establishments.

Personnel

Recruitment of professional personnel was one of the major problems in the organization of the diagnostic center. Because of the large case load expected, and the need for rapid disposition of all cases, it was necessary to call upon community resources to assist in providing the required personnel.

Medical Staff. From a panel prepared by the county medical societies, the medical committee selected 20 practicing physicians on the basis of their special training and experience in tuberculosis and diseases of the chest. Each served on a part-time basis and received a modest honorarium for his services. The schedule was arranged in such a way that medical staff services were available at all times, with the size of the staff at a given time depending on the expected case load.

The Director of the Division of Tuberculosis Control of the Denver Bureau of Health and Hospitals was designated as medical director of the diagnostic center. In this capacity, he was responsible for the general direction of the diagnostic center and for carrying out the basic policies of the program as set up by the medical committee and approved by the county medical societies. Direct management of the center was made the responsibility of a full-time assistant director;

for this post, the regional office of the Public Health Service contributed the full-time services of its tuberculosis consultant for the entire period of the center's operation.

Essentially, the functions of the physician serving in the diagnostic center included the following:

1. To make a clinical evaluation of the case on the basis of the assembled data, such as clinical history, radiographic findings, and laboratory reports;
2. To establish either a definitive or a presumptive diagnosis;
3. To acquaint the patient with the nature of his condition and to explain the need for further medical care and follow-up, when indicated;
4. To initiate referral and to transmit a summary of the findings to the private physician or agency to which the patient was referred for follow-up.

It should be noted that the active participation of the relatively large number of practicing physicians who comprised the center's medical staff was of distinct value from the community point of view. By providing a link between the survey organization and the medical profession at large, these physicians served to sharpen professional interest not only in the survey activity but in the whole tuberculosis control program as well.

Nursing Staff. In part, services of the diagnostic center's nursing staff were contributed by the official health agencies participating in the survey, that is, the State and local health departments and the Public Health Service. Additional nurses needed to complete the center's staff were recruited locally and employed by the survey organization for the duration of the project.

In all, 10 full-time nurses served at the diagnostic center throughout the period of its operation. One of these nurses, who served in a supervisory capacity, was assigned by the Denver Bureau of Health and Hospitals, while another, who served as a consultant, came from the Colorado State Department of Public Health. In addition to the full-time staff, the center had the assistance of many part-time nurses who were assigned by some of the official and voluntary agencies, especially during the period when the case load was at its peak.

It should be pointed out that the nurses assigned to the diagnostic center were responsible only for work at that location. Responsibility for meeting the increased need for public health nursing service in the field was left entirely to the local, official health agencies.

At the diagnostic center, the nurse occupied one of the key positions. Because available medical staff services were limited and had to be used economically, certain functions which would ordinarily be carried out by the physician had to be assigned to the nursing staff. The nurse was therefore responsible for taking the clinical history and for establishing the necessary personal rapport with the patient.

It was her task to explain to the patient the reason for his recall to the center and to acquaint him with the procedures that would be required to establish a diagnosis. In addition, the nurse had the responsibility for performing tuberculin and other skin tests, extracting gastric contents for bacteriological studies, and for instructing the patient regarding the collection of sputum. Upon completion of diagnostic studies in an individual case, it was the nurse's responsibility to impress upon the patient the importance of carrying out the physician's recommendations concerning medical care and further follow-up.

Medical Students. During the summer vacation period, four medical students were assigned to the center to assist the professional staff with routine duties. In this fashion, the staff was augmented for approximately 3 months, and the students were provided an opportunity to gain useful clinical experience. Essentially, their assigned function and responsibilities were similar to those discharged by the nurses. However, since this group consisted of third- and fourth-year students, they were given every opportunity to increase their clinical knowledge through observation and instruction by the medical staff.

Social Service Staff. In order to meet the many social, economic, and emotional problems that were bound to present themselves when patients received diagnoses of tuberculosis or other pathological conditions, two full-time medical social case workers were assigned to the diagnostic center for the duration of its operation. One of these medical social workers was loaned to the center by the Public Health Service to work full-time, and a number of additional workers from the community contributed part-time services on a voluntary basis when the case load was at its peak. In addition, the services of the Director of Medical Social Service of the Denver Bureau of Health and Hospitals were made available for general supervision of social work activities.

Because of the rather circumscribed activities of the diagnostic center, the social case-work services available at the center were also necessarily limited. In essence, the prime responsibility of the social worker was to assist the patient to obtain medical care and further follow-up when recommended by the center physician.

The services of the social work staff were especially valuable in the many instances where a patient reacted emotionally to a diagnosis of tuberculosis or other pathological condition. Obviously, the serious and difficult social, economic, and emotional problems brought to light as the result of the discovery of an unsuspected ailment could not be solved within the circumscribed setup of the diagnostic center. However, when such problems were revealed, efforts were made to

assist the patient and his family by referring them to the agency which would be in the best position to provide the necessary service.

Clerical and Stenographic Staff. The arduous task of handling a great volume of records and taking care of an enormous amount of correspondence required the services of a large clerical and stenographic staff. Personnel for these functions was provided in part by the Public Health Service and in part through the employment of clerks and stenographers by the survey organization. In addition, a staff member of the Public Health Service was assigned to the diagnostic center as records supervisor for the duration of its operation.

Laboratory Services

Before the program of the diagnostic center could be carried out, it was, of course, necessary to provide adequate facilities for bacteriological studies. Since there were no facilities in the community equipped to handle the great load of laboratory work which would result from the diagnostic center's activities, it was obvious that special arrangements would have to be made for this purpose.

Financial assistance for this work was provided by the Division of Research Grants and Fellowships of the National Institutes of Health, Public Health Service. In addition, two Public Health Service laboratory technicians specially trained in tuberculosis bacteriology were assigned to the survey. As a result, a special laboratory unit was organized to serve a dual purpose: first, to handle the bacteriological work load of the diagnostic center, and second, to support a special research project to determine the diagnostic efficiency of the slide culture method for tubercle bacilli, a rapid culture technique recently developed by Drs. John Berry and Hope Lowry [1 2] of the University of Colorado School of Medicine. Space and major equipment items for the laboratory were provided by the Department of Bacteriology of the Colorado University School of Medicine.

Since these facilities were rather limited, it soon became evident that they could not adequately handle the large volume of work required by the diagnostic center. It was therefore necessary to obtain the assistance of the Division of Laboratories of the Colorado State Department of Health in order to take care of the excess load of laboratory specimens collected at the center.

Although improvised, the laboratory facilities provided for the diagnostic center proved to be reasonably adequate. Problems actually encountered were due in part to the improvised nature of the laboratory facilities and in part to the difficulty in obtaining sufficient numbers of specimens from the patients.

[1] Berry, J. W., and Lowry, Hope: A slide culture method for the early detection and observation of growth of the tubercle bacillus. A preliminary report. Am. Rev. Tuberc. **60**: 51 (1949).

[2] Lowry, H., and Berry, J. W.: Further observations on the technic of slide culture of tubercle bacillus. Am. J. Clin. Path. **20**: 273 (1950).

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Operating Policies

In principle, the function of the diagnostic center was to establish, insofar as possible, clinical diagnoses in those persons whose initial screening films had suggested the need for further examination. The principal emphasis, of course, was on the discovery of tuberculosis, including a determination of activity. Diagnostic studies were to be completed within the shortest possible time and were to be limited to those procedures which would be of the greatest practical value from the standpoint of the immediate disposition of each case. Furthermore, cases were to be carried in the diagnostic center only as long as necessary to establish either a definitive or presumptive clinical diagnosis. Prolonged follow-up, where indicated, was to be accomplished through referral to the private physician or to a public clinic. The specific type of referral, either for such follow-up or for treatment, was to be based on the patient's ability to pay for these services, and complete diagnostic information was to be made available to the physician, clinic, or hospital of referral.

As for the specific procedures to be employed in performing the diagnostic studies, policies had to be developed that would be both practical and realistic in terms of the existing limitations and of an expectedly large case load to be disposed of within a limited period of time. Ideally, it would have been desirable to set up uniform standards and criteria for the diagnostic evaluation of all cases, and to require intensive bacteriological studies, tuberculin tests, and, possibly, other skin tests, of all individuals with X-ray findings in any way suggestive of a tuberculous lesion. It was obviously impossible to consider such a program, for, even if the necessary facilities had been available, the practical results would probably not be commensurate with the enormous effort required. Moreover, one could not expect to obtain the degree of cooperation necessary for such laborious and time-consuming procedures with a probable case load of thousands of persons, most of whom would be entirely free of symptoms. It was therefore essential to adopt the principle of selection, with the apparent clinical significance of each case determining the extent of diagnostic study.

A certain amount of data, such as clinical history, 14″ x 17″ X-ray film in the conventional position, and a sputum examination for tubercle bacilli, were set down as the minimum requirements for all cases with abnormal pulmonary findings in the screening film. Further studies, such as additional X-ray films in various positions, fluoroscopy, more intensive bacteriological examinations, tuberculin tests, and other skin tests, were to be carried out only at the request of the physician reviewing the case. In general, determinations regarding more intensive studies were based on consideration of a

patient's past history and present symptoms and on a careful evaluation of the character, extent, and location of the lesion demonstrated on the 14" x 17" film.

Considering the large volume of work to be performed within a short period of time, and the fact that facilities were to be limited and improvised, it would have been entirely unrealistic to expect to establish a definite clinical diagnosis in all, or even in a majority of the cases. Nor could this goal be regarded as falling within the scope of a community-wide mass survey. If such a survey succeeds in identifying those persons in need of immediate medical care and treatment and those in need of follow-up, it may be said that the project has achieved its objectives.

In dealing with nontuberculous pathological chest conditions, the aim of the diagnostic center was to be, insofar as possible, the differentiation of such lesions from pulmonary tuberculosis by means of the usual clinical, radiographic, and laboratory studies. If more elaborate examinations, such as bronchoscopy, bronchography, biopsy, and other laboratory studies, seemed to be indicated, appropriate follow-up referrals were to be made.

As for cardiovascular conditions, no provisions were made to carry out the diagnostic elaboration of the screening-film findings through the diagnostic center. It was the opinion of the medical committee that the evaluation of these conditions could not be considered the responsibility of the diagnostic center. All persons with screening films suggesting the presence of cardiovascular abnormalities were therefore to be recalled for an interview, at which time they were to be advised of the need for further examination and referred either to their private physicians or to a free clinic. Because of limited personnel and facilities, no further steps to insure follow-up could be considered.

Guide for Diagnostic Center Referrals

Obviously, no hard and fast rules could be made for referrals to the diagnostic center following the interpretation of the 70-mm. screening film. In reading these miniature X-ray films, the physicians assigned to the survey team exercised full independence of judgment in making recommendations for referring patients to the diagnostic center for further study. It was recognized that in a mass survey of this type there would be a relatively large number of individuals showing minor abnormalities in the miniature chest X-ray films. For this reason, it was essential to distinguish such conditions from lesions which, on the basis of their roentgenographic appearance, give the impression of being either of definite or possible clinical significance. As a means of determining the conditions under which referrals to the diagnostic center were to be made, the following guide was set up on the basis of the interpretation of the 70-mm. screening film:

A. The following conditions indicated on the 70-mm. film, although not necessarily construed as normal, were not considered in need of a 14" x 17" confirmatory film or other diagnostic studies:

1. Lungs:
   a. Scattered, calcified nodules, either single or multiple, few in number.
   b. Slight or indefinite prominence of pulmonary markings consistent with variations in technique and the individual's age.
   c. Anatomical abnormalities, such as azygos fissure or fissure of an inferior accessory lobe.
   d. Small, localized, emphysematous blebs, without other demonstrable abnormal findings.
   e. Metallic foreign body, with no other abnormal findings in the lungs or other intrathoracic structures.
2. Pleura:
   a. Apical pleural caps, in the absence of any indication of a parenchymal lesion.
   b. Slight pleural thickening and adhesions, such as obliteration of the costophrenic sinus or thickening of the interlobar septum without suggestion of possible effusion.
3. Mediastinum and hilar structures—single or multiple calcified foci.
4. Cardiovascular structures:
   a. Elongated, ptotic, or "dropped" heart.
   b. Rotation of heart and greater vessels associated with dorsal scoliosis.
   c. Moderate aortic widening and tortuosity.
   d. Aortic knob calcification.
5. Diaphragm:
   a. Lobulations or serrations which are within normal limits.
   b. Slight elevation, without indication of possible eventration or herniation.
6. Bony thorax:
   a. Congenital or developmental anomalies of ribs, clavicle or other structures of the thoracic cage.
   b. Fractures of ribs or clavicles.
   c. Rib defects resulting from thoracotomy in the absence of significant pulmonary or pleural abnormalities.
7. Spine:
   a. Congenital anomalies.
   b. Arthritic changes.
   c. Slight to moderate scoliosis.
8. Neck:
   a. Calcified lymph nodes.
   b. Calcified blood vessels.
   c. Calcified laryngeal cartilages.
   d. Metallic foreign bodies.

B. *Abnormal Findings.* It is not possible to specify and enumerate the great variety of abnormal chest conditions observable in the miniature films which would require the taking of a 14" x 17" confirmatory film or other diagnostic studies. However, when the following conditions were noted in the 70-mm. film, recommendations for further study were generally made:

1. Lungs and pleura—Abnormal pulmonary or pleural findings other than those indicated under A-1 which were either suggestive of a tuberculous lesion or which, on the basis of the miniature film alone, could not be definitely distinguished from tuberculosis.

2. Mediastinum and hilar structures—Findings other than those indicated under A-3 which may cause an enlargement or abnormal appearances of those

structures and which, on the basis of the 70-mm. film, could not be definitely identified as of vascular origin.

3. Diaphragm—Significant elevation of the diaphragm or suspected herniation.
4. Cardiovascular structures:
   a. Cardiac enlargement to the right or left, or both.
   b. Straight left cardiac border.
   c. Prominent pulmonic conus.
   d. Prominent left ventricle (hypertensive or boot-shaped).
   e. Localized prominence of the left ventricular border.
   f. Greater vessel enlargement sufficient to suggest the presence of aneurysm.
   g. Suggestive evidence of pulmonary congestion, i.e., "fuzzy" hilar shadows, "butterfly" perihilar densities, with or without evidence of basal congestion or pleural effusion.
   h. Absence of aortic knob.
   i. Apparent right-sided aorta.
   j. Calcified pericardium.
   k. Any additional or unusual findings that cannot be definitely classified as conditions which may fall within normal limits.

Classification of Pulmonary Tuberculosis

It was proposed that the classification of pulmonary tuberculosis following diagnostic evaluation at the diagnostic center should be based on the accepted "diagnostic standards" of the National Tuberculosis Association (1940 edition). It was recognized, however, that in a certain proportion of cases, a definite determination of the clinical status of the disease would not be possible because of insufficient observation. For this reason, and for the purpose of arriving at an initial disposition of the cases concerned, it was necessary to consider a departure from some of the established standards, especially those dealing with activity status.

Thus, it was recognized that certain cases would have to be considered active and probably in need of treatment on the basis of clinical and X-ray findings alone, even without the presence of confirmatory bacteriological findings. On the other hand, it was expected that a much larger number of cases would be found on the routine X-ray in which the lesions, although detected for the first time, could with reasonable safety be classified as inactive on the basis of the roentgenographic appearance. This was felt to apply particularly to lesions of minimal extent which were expected to make up a large proportion of all cases of tuberculosis found in the survey. It was therefore considered impractical and inadvisable to insist on a specified period of observed stability before classifying such cases as inactive tuberculosis.

Finally, it was acknowledged that certain cases would definitely require a certain period of follow-up observation in order to make any determination of the activity of the lesion. These cases were to be classified as of undetermined activity, and careful follow-up to determine their actual clinical status was to be recommended for

these patients. With the exception of these cases, classifications were to be assigned as follows:

1. According to stage of disease:
   Minimal.
   Moderately advanced.
   Far advanced.
2. According to activity:
   Active.
   Inactive.

Operating Procedures

The diagnostic center was in operation from July 5 to October 31, 1949, a period of nearly 4 months. The work schedule involved the usual 8-hour day, 5 days a week, and one evening session per week. The operating routine employed in the center during that period is presented graphically in the chart.

The case load at the center showed a rapid increase from the start, reaching a peak of 300–350 patient visits per day, at which point it remained for a period of approximately 6 weeks. During the subsequent weeks, there was a gradual decline in the volume of work at the diagnostic center because of the decreasing numbers of persons participating in the survey during this period and because of the large number of persons who had already been cleared through the center in the preceding weeks of operation.

The total number of persons who were requested to report to the diagnostic center amounted to 9,783 (excluding 863 persons with abnormal small-film findings not requested to return to the diagnostic center because they resided outside the survey area). Of these, a total of 8,003 persons made one or more visits to the center. In other words, 81.8 percent of those invited to report to the diagnostic center actually did so.[3] Table 1 shows in detail the number of persons invited to return to the diagnostic center and the number who responded to the invitation; it should be noted that these figures refer to the type of abnormality observed in the initial screening film prior to clinical evaluation at the diagnostic center. It should also be pointed out that the total number of persons in whom a clinical diagnosis could actually be determined was higher than indicated in table 1 since necessary information on a certain number of cases who did not report was obtainable from other sources, such as private physicians, institutions, and tuberculosis case registers.

In all, the number of patient visits to the diagnostic center amounted to 15,234. Thirty percent of the cases made one visit only. This group consisted mainly of two types of cases: (a) Those whose initial screening films had been classed as "suspect" and whose subsequent

[3] Approximately 600 of those who failed to report to the center were found to be under medical supervision, and no effort was made in these cases to obtain response to the recall notification.

DENVER AND TRI-COUNTY CHEST X-RAY SURVEY

Classification of X-ray Findings and Disposition of Cases

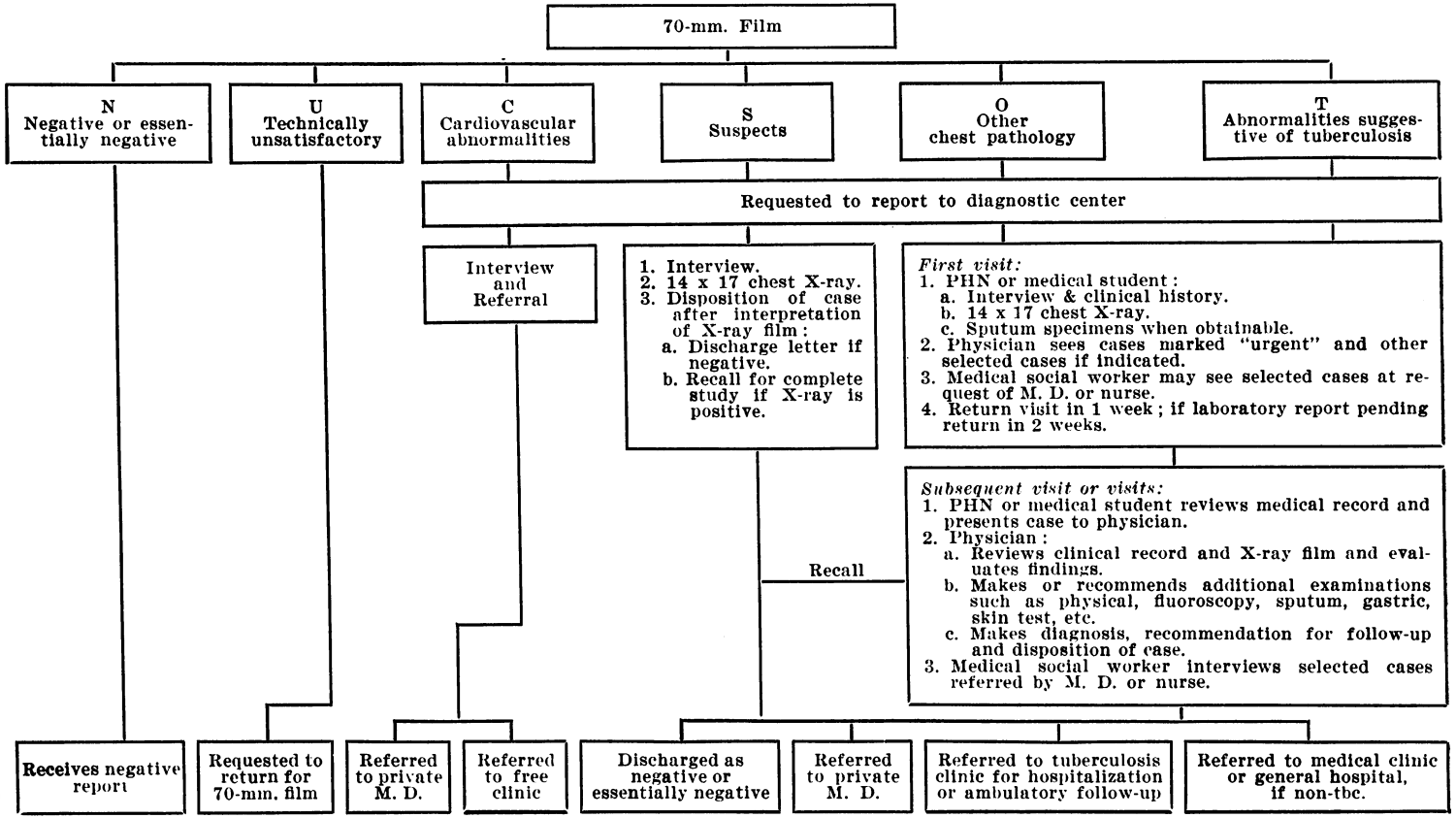

Table 1. *Response to diagnostic center recalls*

70-mm. film interpretation	Number of persons invited	Number of persons responding	Percent of response
Tuberculosis	4,016	3,230	80.4
Other chest pathology	1,660	1,389	83.7
Suspects	2,599	2,273	87.5
Cardiovascular	1,508	1,111	73.7
Total	9,783	8,003	81.8

14″ x 17″ X-ray films were interpreted as essentially negative; these persons were notified of the results by letter and were not requested to return for a subsequent visit. (b) Those whose 70-mm. X-ray films had suggested cardiovascular abnormalities and who were recalled merely for interview and referral; no further studies were carried out for these persons at the diagnostic center.

About 59 percent of the patients made two visits each, and the remainder, 11 percent, made three or more visits to the diagnostic center. The limited number of visits which were made by the majority of the cases may be regarded as an indication of the "streamlined" procedures which were of necessity adopted for the diagnostic center.

The total number of persons who had 14″ x 17″ chest X-ray films taken at the diagnostic center amounted to 7,611. In a majority of these cases, the radiographic examination was limited to a single film in the conventional position. In a considerable number of cases, however, additional roentgenograms, including oblique, lateral, and lordotic views of the chest, as well as esophagrams, were obtained at the request of the examining physician.

At the diagnostic center, collection of sputum specimens and extraction of gastric contents was a daily routine procedure. Similarly, tuberculin skin testing and, in many cases, histoplasmin and coccidioidin skin tests were also employed at the request of the examining physician. The tuberculin used was OT in a dilution of 1 : 10,000 as the first strength, and 1:100 as the second strength. Histoplasmin and coccidioidin skin-test antigens were used in the standard dilutions of 1:100. The use of these skin tests proved of great help in excluding the tuberculous etiology of many lesions of questionable origin and in directing the physicians' attention toward diagnostic possibilities other than tuberculosis.

Work-up and Disposition

All patients referred to the diagnostic center for study following the interpretation of the 70-mm. screening film were subjected to a predetermined routine of diagnostic work-up and disposition. The specific procedures to be employed in each case depended largely on the 70-mm. film impression. The cases were divided into three general

categories: (a) those patients whose initial screening films had been classified as "tuberculosis" or "other chest pathology"; (b) those whose 70-mm. films had been classified as "suspect" (i. e., those with questionably abnormal or indeterminate film findings); and (c) those classified as "cardiac."

Tuberculosis and Other Chest Pathology. Persons suspected of having tuberculosis or other chest pathology received a letter requesting them to report to the diagnostic center for further study. During the first visit, the patients were received by a public health nurse or a medical student who explained the reason for the recall to the diagnostic center and recorded identification data and clinical history. A 14" x 17" chest X-ray was then made, and sputum specimens were collected when they were available. If the case had been marked as "urgent" by the reader of the miniature film, or if the patient indicated that he was aware of the condition for which he had been recalled to the diagnostic center, a physician was asked to see the patient to determine what further steps should be taken. Where social, emotional, or economic problems were apparent during this first visit or in subsequent ones, the patients were referred to the medical social worker assigned to the center. Each patient was given an appointment to return to the diagnostic center in 1 week if no sputum was being collected. If, however, sputum had been collected or was being collected, the patients were asked to return in 2 weeks.

At each subsequent visit to the diagnostic center, each patient was received by a public health nurse or a medical student who reviewed the medical record to determine whether it had been properly filled out and to add all necessary information which had not been obtained at the time of the previous visit. The patient was then directed to a physician who, in turn, reviewed the medical record and entered necessary additions. The physician then read the 14" x 17" confirmatory film, recorded the findings, and interpreted them to the patient. Where indicated, the physician carried out physical examination and fluoroscopy and made any necessary recommendations for further study, such as the examination of gastric washings or skin tests. In cases where these additional studies had already been conducted, the physician interpreted the findings to the patient. Finally, if it was the physician's opinion that adequate information was available to permit either a definite or presumptive diagnosis, the diagnosis was recorded together with appropriate recommendations for further follow-up. The case was then discharged from the diagnostic center.

Suspects. Persons classified as "suspects" on the basis of the miniature film received a letter requesting them to return to the diagnostic center. They were interviewed by a public health nurse or a medical student who explained why they had been asked to report to

the diagnostic center and recorded the essential identifying data together with a brief clinical history. A 14″ x 17″ chest X-ray was then taken, but no other studies were carried out unless indicated by the findings on the confirmatory film. The patient was advised that he would receive a letter stating either that the 14″ x 17″ film had not revealed findings requiring any further medical attention or that he was to return to the diagnostic center for further examination. In the latter event, the subsequent procedures were essentially the same as for persons whose 70-mm. films had been classed as either "tuberculosis" or "other chest pathology."

Cardiovascular Diseases. Persons whose miniature films indicated findings suggestive of cardiovascular abnormalities received a letter requesting them to report to the diagnostic center. When they appeared at the center, they were interviewed by a public health nurse or a medical student and given an explanation for their recall. They were then given a letter of referral to a private physician or to a free clinic, depending on their financial status and ability to pay for further follow-up and care.

Nonrespondents

It was to be expected that some of the persons requested to report to the diagnostic center would fail to do so for one reason or another. For example, some of those asked to return for further study notified the center that they were aware of the abnormal chest conditions which had resulted in their recall notifications, and indicated that they were already under medical supervision. Others informed the center that they had elected to receive medical follow-up from their own physicians. In all such instances, the staff of the diagnostic center made the appropriate follow-up contacts (with private physicians, clinics, hospitals, and other agencies) in order to verify the patients' statements and to obtain the clinical information needed to close the cases at the center.

With those persons who failed to report to the center after two letter notifications and who furnished no information indicating medical follow-up, the following action was taken:

1. The initial screening films were re-evaluated by the center's medical director or his representative in order to eliminate those for whom further follow-up did not appear to be essential. Thus, attention was focused on those most probably in need of further follow-up study and in whom further efforts would be most productive in terms of the probable significance of the small-film findings. Moreover, this selective approach assured the best utilization of the limited resources available for the follow-up of nonrespondents.

2. After review of the screening films, those cases felt to be of sufficient significance to warrant further effort were referred to the

center's public health nursing staff for follow-up by telephone. If these efforts failed—if the patient could not be reached by telephone, or if he failed to report to the center after several telephone calls—the case was then referred to the health department's field nursing staff for follow-up by home visit.

3. Home visits were made by health department field nurses during which efforts were made to convince the patients of the need for further diagnostic study either at the center or under other auspices.

4. In cases where all follow-up efforts failed, or where the individuals could not be reached, the 70-mm. screening films were again reviewed in order to find those with probable diagnoses of significant tuberculosis. These were turned over to the health department for follow-up through established facilities and procedures. In cases where 70-mm. films suggested nontuberculosis chest pathology, no further follow-up efforts were made, and no report was filed with the health department.

Laboratory Procedures

At the time of the 14″ x 17″ X-ray examination, all patients whose miniature films had been classified as "tuberculosis" or "other chest pathology" were given one sputum bottle and instructions for collecting a 48-hour sputum specimen. The specimens were returned by the patients to the diagnostic center or to other designated stations. Upon receipt in the laboratory, 15 cc. of sputum were removed from the entire specimen and homogenized in a paint shaker (where the specimen amounted to less than 15 cc., the whole specimen was used). The homogenized specimen was then divided into two equal parts and treated as follows:

1. Routine method: the specimen was concentrated with sodium hydroxide and a smear was made of the concentrate. Simultaneously, three tubes of Petragnani's medium were inoculated; cultures were discarded at the end of 8 weeks.

2. Slide culture method: three thick smears were made, treated with acid, washed with water, and incubated in Kirshner's medium with albumin added. After the 2d, 4th, and 6th day, respectively, one culture was removed, stained, and examined under the microscope.

Patients who produced no sputum were, upon direction of the examining physician, given appointments to return to the diagnostic center for gastric lavage. Where possible, three gastric specimens were obtained for examination by culture. Specimens were neutralized immediately with sodium hydroxide, refrigerated, and delivered to the laboratory by 10 a. m. At the laboratory, specimens were centrifuged and sediment was divided into two equal parts, after which procedures for the routine culture method and the slide culture method were followed. No direct smear was made.

In all cases referred for bacteriological work-up, the laboratory

kept careful records of the patient's name and survey number, the culture number, and of the results of the smear, the slide culture, and the routine culture. Daily reports were returned to the diagnostic center on a form provided for that purpose, together with all other available information. Smears were reported in the following manner:

a. No AFB seen.
b. 1, 2, 3, 4, 5 AFB seen.
c. Few AFB.
d. Many AFB.
e. Numerous AFB.

Slide cultures were reported as follows:

a. Negative at 2, 4, or 6 days.
b. Positive at 2, 4, or 6 days.

Routine cultures were reported as follows:

a. No growth present.
b. AFB present.

Results [4]

In all, 326,326 photoroentgen films were taken in the survey. Of this total, 2,230 were technically unsatisfactory for diagnostic interpretation, so that the remaining films, totaling 324,096, can be considered as representing the actual number of persons participating in the survey. Except where otherwise noted, the analysis of abnormal findings is based on diagnoses made at the diagnostic center. However, 82 percent of the cases included in the group of cardiovascular abnormalities were so classified on the basis of 70-mm. film impressions and not upon a clinical diagnosis.

Table 2 summarizes the general findings of the survey. As indicated, 97.5 percent of all persons participating in the screening program were found to be essentially negative, either on the basis of the initial 70-mm. film or following study at the diagnostic center.

Translating the percentages shown for tuberculosis into rates per 1,000 persons examined, it is apparent that tuberculosis prevalence among the surveyed population was about 13 per 1,000. Cases classed as active tuberculosis amounted to 1 per 1,000. These rates are roughly comparable with findings of other mass X-ray surveys.

Included in the group of nontuberculous chest conditions was a large variety of abnormal findings ranging from abnormalities of little clinical significance to serious conditions requiring immediate medical attention. Among the more significant pathological conditions were 231 cases of bronchiectasis and other chronic, inflammatory, or suppurative diseases of the lungs and bronchi; 240 cases diagnosed either as definite or possible intrathoracic neoplasm; and 335 cases of silicosis.

[4] A more complete statistical analysis and interpretation of the survey findings will appear in a later issue.

It should be pointed out that the data concerning the frequency of nontuberculous chest lesions are of a preliminary nature, since the majority of the diagnoses were based on clinical and radiographic findings alone. In keeping with diagnostic center policy, the exhaustive studies necessary to establish final diagnoses were not undertaken.

Table 2. *Number and percent of cases by broad diagnostic classification*

Findings	Number	Percent
Total persons surveyed	324,096	100.0
Essentially negative	315,911	97.5
By 70-mm. film	314,381	97.0
By diagnostic center	1,530	.5
Tuberculosis	4,231	1.3
Active	366	.1
Questionably active	544	.2
Inactive	3,321	1.0
Other chest pathology	2,261	.7
Cardiovascular abnormalities	1,693	.5
By 70-mm. film	1,390	.4
By diagnostic center	303	.1

Data concerning cardiovascular abnormalities are based chiefly on 70-mm. film impressions since most of these cases were not given clinical study at the diagnostic center.

Source of Diagnosis

Table 3 shows the distribution of diagnosed cases according to source of diagnosis. Cardiovascular abnormalities were excluded, since as explained above, the majority of these cases were classified on the basis of the 70-mm. film alone and since information on clinical follow-up was lacking.

Table 3. *Distribution of diagnosed cases by source of diagnosis*

Source of diagnosis	All diagnoses		Tuberculosis		Chest pathology other than tuberculosis	
	Number	Percent	Number	Percent	Number	Percent
Total	6,492	100.0	4,231	100.0	2,261	100.0
Diagnostic center	5,312	81.8	3,368	79.6	1,944	86.0
Tuberculosis case register	49	.8	47	1.1	2	.1
Other sources	238	3.7	190	4.5	48	2.1
70-mm. film only [1]	893	13.7	626	14.8	267	11.8

[1] For the purpose of statistical analysis, tentative diagnostic classifications were assigned to those remaining cases on the basis of a review of the 70-mm. film.

It will be noted that nearly 82 percent of all cases of tuberculosis and other chest pathology were diagnosed by the diagnostic center. However, the percentage of cases seen by the diagnostic center was somewhat higher for those with nontuberculous chest conditions than for those with tuberculosis. This difference may, perhaps, be explained by the fact that many of those diagnosed as tuberculous had

had previous knowledge of their condition, and hence, had failed to report to the diagnostic center.

By the end of 1949, either definite or presumptive diagnoses had been established in 85.2 percent of the tuberculosis cases and in 88.2 percent of those with other chest pathology. In the remainder of the cases, no information concerning clinical follow-up was available as of that date.

Disposition

At the conclusion of studies at the diagnostic center, 73 percent of all tuberculosis cases for whom further follow-up was recommended were referred to private physicians, and 27 percent were sent to clinics. The majority of the latter were referred either to clinics operated by official health agencies or to outpatient services of the Veterans' Administration.

Of those with active tuberculosis, 42 percent were referred to private physicians, and 58 percent to public health clinics or other agencies providing free medical care. Since the entire group of tuberculosis cases consists predominantly of inactive cases, in a ratio of about 10 inactive cases to 1 active case, the difference between the referrals of the active cases alone and all cases may have significance. The fact that a larger proportion of the active cases were referred to public facilities, may, perhaps, indicate a generally lower socioeconomic status for this particular group than for the entire group of tuberculosis cases.

Provision of institutional care was not the direct responsibility of the diagnostic center. Instead, tuberculosis patients in need of such care were referred to the agency responsible for initiating hospitalization efforts. It should be mentioned in this connection that a considerable number of patients who had originally elected follow-up by private physicians were subsequently referred by their physicians to the public health clinic for further follow-up and for assistance in arranging for institutional admission.

As for patients with chest conditions other than tuberculosis, medical follow-up recommendations by the diagnostic center referred 83 percent to private physicians. The remainder, 17 percent, were referred to public hospitals or out-patient services.

As indicated, the incorporation of a diagnostic center in the Denver and Tri-County Chest X-ray Survey made possible the clinical diagnosis of the majority of "suspects" found in the survey. Obviously, it is still too early to assess the long-range effects of the survey on the tuberculosis control program of the surveyed areas. The indications are, however, that the prompt clinical evaluation of the "suspects," carried out as an integral part of the survey program, will go a long way toward providing the medical care and follow-up

so essential to the prompt restoration of the individual patient and to the protection of the community.

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—Announcement—

Courses in Laboratory Diagnosis of Tuberculosis

In cooperation with the Division of Chronic Disease and Tuberculosis, Public Health Service, the Bacteriology Laboratories of the Communicable Disease Center, Chamblee, Ga., will offer three courses in the laboratory diagnosis of tuberculosis on the following dates:

April 30 to May 11, 1951.
November 5–16, 1951.
November 19–30, 1951.

The courses are open to all grades of employed laboratory personnel who are approved by their State health officers. Practical laboratory training in all phases of tuberculosis bacteriology, including preparation of culture media, microscopy, cultural procedures, diagnostic use of animals, and testing of drug sensitivity will be included in the course. No tuition or laboratory fees are charged.

While reservations for the courses should be made well in advance, there are still a few places available in the course beginning April 30.

In addition, similar courses will be given for laboratory directors, senior laboratory staff members, physicians, and others of comparable professional standing on the following dates:

May 14–18, 1951.
October 29 to November 2, 1951.

Additional information and applications may be obtained from the Chief, Laboratory Services, Communicable Disease Center, Public Health Service, Chamblee, Ga.

BCG Vaccination in Czechoslovakia [1]

After the Second World War, tuberculosis became so widespread in Europe as to create an emergency. Living conditions were generally far below healthful standards, and public health activities were hampered by shortages of supplies and personnel. It was in such a setting that the Joint Enterprise, later known as the International Tuberculosis Campaign, came into being in 1948. Created by the United Nations International Children's Emergency Fund and three Scandinavian voluntary organizations (Danish Red Cross, Norwegian Relief for Europe, and Swedish Red Cross), the ITC was set up in collaboration with the World Health Organization to promote and direct large-scale BCG vaccination programs. By the end of November 1950, some 30 million children and adolescents had been tuberculin tested and almost half as many vaccinated with BCG in campaigns in many countries.

In order that this emergency control measure might contribute also to scientific knowledge about tuberculosis and about BCG, the World Health Organization established the Tuberculosis Research Office at Copenhagen in 1949. "Mass BCG Vaccination in Czechoslovakia 1948–49," is the first published report of a series which will constitute a record from many countries of Europe and other parts of the world where the ITC has conducted vaccination programs. This report was prepared by the staff of the TRO in Copenhagen. It is based on records from the field teams and preliminary tabulations made in the headquarters of the campaign in Bratislava.

A brief description of the operation is given, with details about number of personnel, methods, and expenditures. The Scandinavian teams assumed responsibility for the training of local personnel, and the objective was to cover all persons between the ages of 1 and 20 years throughout the entire country "in accordance with the Czechoslovak Antituberculosis Law of 20 March 1948." At the height of this campaign 46 teams totaling some 260 workers in the field accomplished about 350,000 tuberculin tests per month, and when the work was completed within a year, over 3 million tuberculin tests had been given, covering a very high proportion of the population in the 1–20 age groups. Vaccinations were given to an estimated 86 percent of the total number of tuberculin negative children of school age (6–14) and to a somewhat lower proportion of younger and older children.

[1] A review of "Mass BCG Vaccination in Czechoslovakia 1948–49, with Special Reference to Statistics on Tuberculin Testing and BCG Vaccination." Prepared by the Tuberculosis Research Office, World Health Organization, Copenhagen. Published by the International Tuberculosis Campaign, August 1950. Copies may be obtained from the International Tuberculosis Campaign, Svanemllevej 25, Copenhagen, Denmark.

An example of successful and efficient international cooperation, the campaign was remarkable in organization, magnitude, and speed and quality of field work.

The report competently condenses a vast amount of material in order to present essential information on the operation, including extensive tabulations of participation, tuberculin sensitivity, and vaccinations performed, by age, sex, and detailed geographic subdivisions. The data which are perhaps of greatest general interest at the present time are those on tuberculin sensitivity. Of all those children who had completed tests, 32 percent were tuberculin positive. The percentage rose sharply from 3.8 in the 1-year-olds to 75.2 in the 20–24 year age group. At age 5 it was 11 percent; at age 10, 26 percent; and at age 15, 48 percent. There was little difference in tuberculin sensitivity between boys and girls, and, interestingly enough, between populations of urban and rural districts, at least in the 13 districts where separate tabulations were made. Details of both tuberculin testing and BCG vaccination are given in comprehensive tables and in a number of excellent charts and maps.

The report was prepared with a consideration for the possibility of future attempts to evaluate BCG vaccination. If tuberculosis morbidity and mortality show a definite trend in the years to come, indirect and limited evidence may be found to show a protective value of mass vaccination. In any future study, the present document will be an indispensable guide. The Tuberculosis Research Office has made a valuable contribution in setting a standard that will be a model for other reports.

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 March 17, 1951

Influenza

In collaboration with the Influenza Information Center, National Institutes of Health, the following report on influenza has been prepared.

A total of 16,290 cases of influenza was reported for the current week compared with 14,448 for the previous week, 18,506 for the same week last year, and 3,362 cases for the 5-year median.

The large cities in the following sections showed an increase in the number of deaths from all causes for the week ended March 17 as compared with the 5-year median: New England, 20.7 percent; Middle Atlantic, 7.8; East North Central, 10.7; and 16.4 percent in the Pacific area. Other areas showed no increases.

Two more influenza A-prime strains resembling those isolated last year have been recovered by the Regional Laboratory in Albany, N. Y. One was from a patient in Albany, and the other from a patient in Buffalo, and both were ill in mid-February.

Dr. Herman Bundesen, Chicago Board of Health, reports that the outbreak of respiratory infections was widespread in Chicago, but was a mild type, generally. Some cases had typical symptoms of influenza. Duration of symptoms was approximately 1 week. Recovery of A-prime virus was reported previously.

Influenza A-prime virus was isolated from the throat washings of an 8-year-old child living in the Washington, D. C., area by the National Institutes of Health. The onset of symptoms was about the middle of February.

The Preventive Medicine Division, Office of the Surgeon General of the Army, reports that the Second Army Medical Laboratory has isolated influenza A-prime virus from pooled nasal washings collected at Camp Pickett, Va., February 14; in addition, 3 out of 12 paired sera from Camp Breckinridge, Ky., were found positive for antibody rise against type A-prime influenza virus.

Incidence of influenza has increased in the Charleston, S. C., area according to Dr. Ben H. Boltjes, Department of Bacteriology of the Medical College of South Carolina. Influenza A-prime virus was isolated from throat washings from four students of the Medical College, and diagnosis made by the complement fixation test in five students.

The Collaborating Laboratory at the University of Washington, Seattle, reports that of 32 paired sera, 17 have shown a significant rise in titer against influenza A-prime virus by the complement fixation test. For the week ended March 17, 5,847 cases of influenza or influenzalike respiratory infections were reported in the State of Washington. However, the incidence appears to be declining.

Dr. Erickson, Oregon State Health Officer, reports that influenza in unusual numbers has been reported from widely scattered areas of the State during the past 4 weeks. Jackson County (population of 58,000) has reported 1,750 cases during the past 3 weeks. Absenteeism in schools has increased from an average of 7 to 15 percent. Cases reported correspond clinically with mild influenza but laboratory confirmation has not been completed.

A report from Dr. Morris Schaeffer, Director, Regional Laboratory, Montgomery, Ala., indicates that there was an unusual prevalence of influenza in Montgomery which reached its peak in the middle of February. There was little or no mortality associated with it. Influenza A-prime virus was recovered from throat washings and identified as the infecting type in 13 other cases tested serologically in this area.

Dr. C. C. Kuehn, Louisiana Department of Health, reports that about the middle of February there was a community-wide outbreak of a respiratory disease in and around Baton Rouge. A diagnosis of influenza was established by a significant rise in hemagglutination-inhibition titer for influenza virus A. The laboratory work was done by Dr. John Buddingh, Louisiana State University, who has also collected throat washings for virus isolation. A large number of influenzalike infections have occurred throughout the State. School absences have been numerous, 56 percent in one instance.

Morris Pollard of the University of Texas reports that, in addition to the previously reported outbreak of influenza in Galveston, Beaumont, and Orange, Tex., experienced even more intense outbreaks. There was no unusual mortality, and the outbreak has now waned.

Dr. E. H. Lennette, Director, Regional Laboratory, Berkeley, Calif., reports the serological diagnosis of 57 cases of 107 paired sera tested during the week of March 3–9. Since January 1, of 471 individuals tested, 201 have shown serological evidence of influenza virus A and A-prime infections, and 2 have been positive for influenza virus B in 17 scattered counties. A total of 1,150 additional cases of an influenzalike infection was reported in two northern counties, but influenza appears to be subsiding elsewhere.

Mumps

Dr. A. S. Lazarus, University of Washington, Seattle, reports that local outbreaks of mumps have resulted in several cases of encephalitis without parotitis or with mild parotitis. Complement fixation tests have shown significant increases in titer and have been of diagnostic assistance.

Typhoid Fever

Dr. R. M. Albrecht, New York State Department of Health, reports that the 12 cases of typhoid in a State hospital for the mentally ill had onsets ranging from January 16 to March 1. The cases occurred in all wards of one building. Water and milk supply is common to several buildings, and the kitchen serving the involved building serves two others. The infection is thought to have originated from a carrier, as yet unknown, but secondary cases have occurred.

Poliomyelitis

Dr. Winona Campbell, University of Colorado Medical Center, reports the occurrence of a localized epidemic in a Spanish-American family in San Louis Valley in southern Colorado. Two members had paralysis, and several others had suspicious illnesses. A death in the community has been reported in which poliomyelitis was suspected. Another outbreak of 14 cases of poliomyelitis has occurred since the first of the year in Fort Collins, Larimer County, located in the northern part of the State. Six cases were in adults and 4 of the 14 were reported as bulbar type. Only 2 cases of poliomyelitis were reported in Larimer County in 1950.

Trichinosis

Dr. R. M. Albrecht, New York State Department of Health, has reported an outbreak of eight cases of trichinosis in one family in Plattsburg. Dates of onset were: one case January 1, one January 5; and six, January 8. Symptoms consisted of diarrhea, fever, and muscle pains. Eosinophilia ranged from 18 to 73 percent. Poorly cooked local pork, a specimen of which revealed large numbers of *Trichinella spiralis* larvae, caused the outbreak.

Infectious Hepatitis

Dr. B. G. Hamilton, Missouri Director of Health, has reported the occurrence of two epidemics of infectious hepatitis in two different counties located in the central part of the State. In Calloway County there have been 29 cases, and in Cooper County 28 cases in the past 3 months. School-age children and adults have been affected. New cases are occurring in both areas. No deaths have been reported.

Dr. W. L. Halverson reports 14 cases of infectious hepatitis with 5 in one rural district and 8 in another rural area. The onsets of cases

have been spread over a 4-month period beginning in November 1950, with 4 new cases in February. A history of contact was found in each group, but water and sewage disposal had also been suspected.

Food Poisoning

Dr. R. M. Albrecht, New York State Department of Health, has reported an outbreak of staphylococcus enterotoxin food poisoning involving a number of patients and personnel at a general hospital in central New York State February 7. A similar episode occurred February 14. The vehicle in the first outbreak was chocolate eclairs, and in the second, codfish cakes. These foods were infected by the chef whose hands were affected with an allergic dermatitis. Cultures from his hands, the chocolate eclairs, and the codfish cakes revealed *Staphylococcus aureus.*

Comparative Data for Cases of Specified Reportable Diseases: United States

[Numbers after diseases are International List numbers, 1948 revision]

Disease	Total for week ended—		5-year median 1946–50	Seasonal low week	Cumulative total since seasonal low week		5-year median 1945–46 through 1949–50	Cumulative total for calendar year—		5-year median 1946–50
	Mar. 17, 1951	Mar. 18, 1950			1950–51	1949–50		1951	1950	
Anthrax (062)	1	1	------	(1)	(1)	(1)	(1)	16	5	10
Diphtheria (055)	68	153	170	27th	3,915	6,057	8,743	1,008	1,786	2,385
Encephalitis, acute infectious (082)	26	17	9	(1)	(1)	(1)	(1)	149	137	94
Influenza (480–483)	16,290	18,506	3,362	30th	81,736	85,145	85,145	67,194	74,561	66,915
Measles (085)	17,914	10,119	22,266	35th	168,071	93,331	178,365	139,370	74,201	152,241
Meningitis, meningococcal (057.0)	94	111	99	37th	2,167	1,910	1,905	1,206	996	940
Pneumonia (490–493)	2,275	3,021	(2)	(1)	(1)	(1)	(1)	22,063	27,562	(2)
Poliomyelitis, acute (080)	61	73	33	11th	33,431	42,605	25,409	1,212	1,131	612
Rocky Mountain spotted fever (104)	------	1	------	(1)	(1)	(1)	(1)	3	11	10
Scarlet fever (050)[3]	2,508	1,880	3,129	32d	[4] 41,090	36,019	53,800	[4] 25,399	19,580	29,874
Smallpox (084)	------	------	1	35th	14	20	53	6	12	32
Tularemia (059)	15	18	16	(1)	(1)	(1)	(1)	151	254	254
Typhoid and paratyphoid fever (040, 041)[5]	29	39	48	11th	3,350	3,883	3,883	435	510	485
Whooping cough (056)	1,444	2,867	2,269	39th	39,467	49,670	49,670	17,865	28,134	24,659

[1] Not computed. [2] Data not available. [3] Including cases reported as streptococcal sore throat. [4] Deduction: Georgia, week ended Feb. 24, 2 cases. [5] Including cases reported as salmonellosis.

Reported Cases of Selected Communicable Diseases: United States, Week Ended March 17, 1951

[Numbers under diseases are International List numbers, 1948 revision]

Area	Diphtheria (055)	Encephalitis, infectious (082)	Influenza (480–483)	Measles (085)	Meningitis, meningococcal (057.0)	Pneumonia (490–493)	Poliomyelitis (080)
United States	**68**	**26**	**16,290**	**17,914**	**94**	**2,275**	**61**
New England		**3**	**1,444**	**565**	**3**	**171**	
Maine		1		12	1	24	
New Hampshire			664	25		24	
Vermont			67	105			
Massachusetts		1		365	1		
Rhode Island			10	2	1	2	
Connecticut		1	703	56		121	
Middle Atlantic	**12**	**5**	**411**	**2,362**	**16**	**383**	**4**
New York	5	3	[1] 51	883	6	122	4
New Jersey	2	2	360	561	3	98	
Pennsylvania	5			918	7	163	
East North Central	**5**	**5**	**66**	**3,177**	**25**	**237**	**8**
Ohio	1			820	11		1
Indiana	1		13	433	1	20	
Illinois	2	3	11	623	6	99	6
Michigan	1	2	42	517	3	118	1
Wisconsin				784	4		
West North Central	**1**	**3**	**20**	**929**	**3**	**46**	**4**
Minnesota			4	94		5	
Iowa			1	32	1	2	2
Missouri	1		7	311	2	1	
North Dakota			5	129		16	
South Dakota		1		40			
Nebraska				25			2
Kansas		2	3	298		22	
South Atlantic	**17**	**2**	**2,604**	**1,382**	**16**	**255**	**7**
Delaware				39			
Maryland	3		20	126	2	36	
District of Columbia			2	69	1	16	
Virginia	3		446	479	3	95	
West Virginia	1		1,562	60	1	38	
North Carolina	4	2		162	5		1
South Carolina	6		189	22		29	
Georgia			385	369	2	41	1
Florida				56	2		5
East South Central	**7**	**3**	**176**	**687**	**8**	**133**	**10**
Kentucky	3		23	443	1	7	
Tennessee	2	1	102	74	6		
Alabama		1		45	1	81	5
Mississippi	2	1	51	125		45	5
West South Central	**14**	**3**	**800**	**3,876**	**10**	**694**	**6**
Arkansas	4		466	332	1	90	
Louisiana	1		12	68	3	32	
Oklahoma	2	1	322	358		62	
Texas	7	2		3,118	6	510	6
Mountain	**1**	**1**	**2,931**	**2,066**	**4**	**161**	**8**
Montana		1	72	64	1	2	
Idaho				26			
Wyoming				282	1	4	1
Colorado			33	664	2	28	2
New Mexico	1		13	46		36	2
Arizona			2,795	855		91	2
Utah				107			1
Nevada			18	22			
Pacific	**11**	**1**	**7,838**	**2,870**	**9**	**195**	**14**
Washington			5,847	661	3	6	2
Oregon	5		1,439	84		78	3
California	6	1	552	2,125	6	111	9
Alaska			42			4	3
Hawaii			3	5			

[1] New York City only.
Anthrax: New Jersey, 1 case.

Reported Cases of Selected Communicable Diseases: United States, Week Ended March 17, 1951—Continued

[Numbers under diseases are International List numbers, 1948 revision]

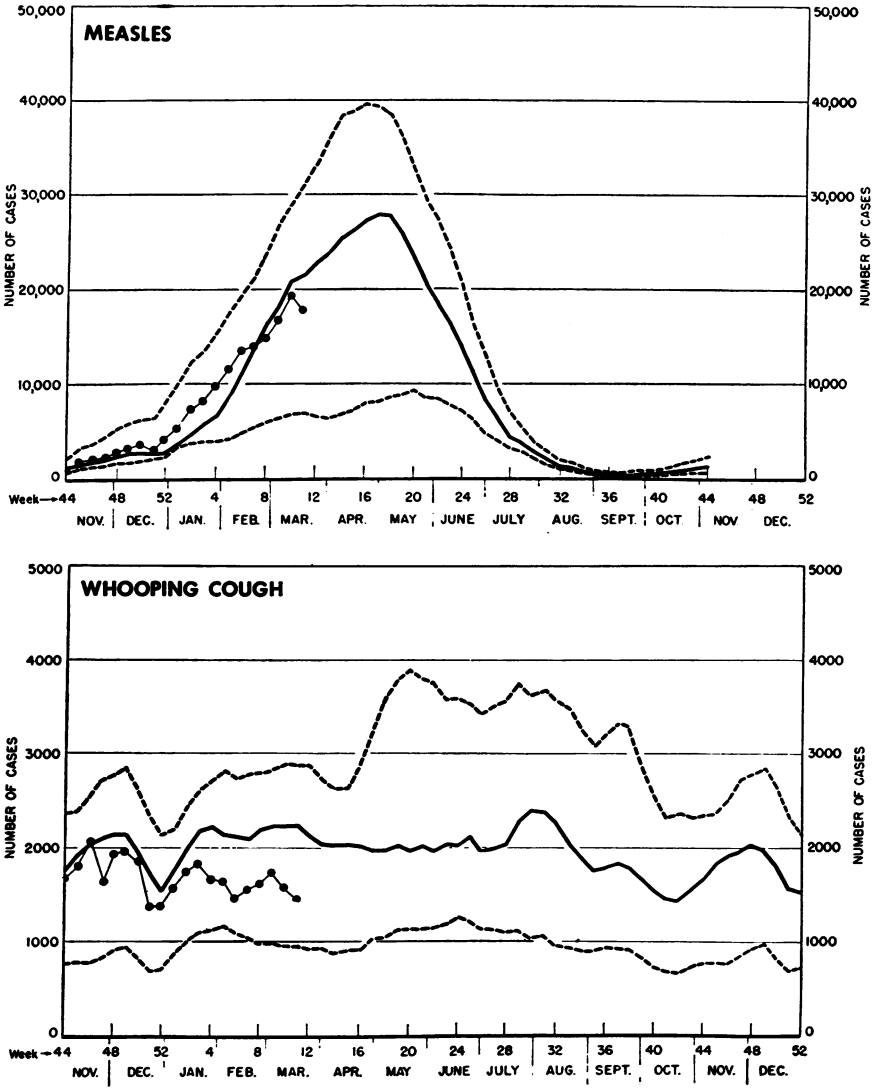
Area	Rocky Mountain spotted fever (104)	Scarlet fever (050)	Smallpox (084)	Tularemia (059)	Typhoid and paratyphoid fever [1] (040, 041)	Whooping cough (056)	Rabies in animals
United States		**2,508**		**15**	**29**	**1,444**	**166**
New England		**203**				**74**	
Maine		19				21	
New Hampshire		[2] 13				5	
Vermont		6				2	
Massachusetts		127				33	
Rhode Island		9				9	
Connecticut		29				4	
Middle Atlantic		**466**		**1**	**2**	**255**	**19**
New York		[2] 223				107	19
New Jersey		[2] 84				74	
Pennsylvania		159		1	2	74	
East North Central		**743**		**5**	**2**	**230**	**8**
Ohio		198			1	56	1
Indiana		87			1	12	5
Illinois		121		5		28	1
Michigan		277				61	1
Wisconsin		60				73	
West North Central		**138**			**4**	**60**	**14**
Minnesota		51				10	
Iowa		12				4	13
Missouri		38			4	7	
North Dakota		7				2	
South Dakota						1	
Nebraska		8				2	
Kansas		22				34	1
South Atlantic		**222**		**4**	**3**	**193**	**26**
Delaware		4				2	
Maryland		42				14	
District of Columbia		24				2	
Virginia		19			1	35	2
West Virginia		20				27	2
North Carolina		69				57	
South Carolina		7				22	14
Georgia		15		4	2	24	8
Florida		[2] 22				10	
East South Central		**85**		**1**	**3**	**71**	**30**
Kentucky		24				16	18
Tennessee		39			3	36	6
Alabama		17				15	3
Mississippi		5		1		4	3
West South Central		**105**		**4**	**8**	**357**	**50**
Arkansas		6				18	4
Louisiana		5			2	4	
Oklahoma		14		1	2	15	1
Texas		80		3	4	320	45
Mountain		**176**			**5**	**126**	**13**
Montana		5				9	3
Idaho		21				4	
Wyoming		4					9
Colorado		18			1	17	
New Mexico		1			1	30	
Arizona		12			3	59	1
Utah		[2] 113				7	
Nevada		2					
Pacific		**370**			**2**	**78**	**6**
Washington		89				24	4
Oregon		46				8	
California		[2] 235			2	46	2
Alaska		1				6	
Hawaii							

[1] Including cases reported as salmonellosis.
Psittacosis: Chicago, Ill., 1 case.

[2] Including cases reported as streptococcal sore throat.

Communicable Disease Charts

All reporting States, November 1950 through March 17, 1951



The upper and lower broken lines represent the highest and lowest figures recorded for the corresponding weeks in the preceding 5 years. The solid line is a median figure for the preceding 5 years. All three lines have been smoothed by a 3-week moving average. The dots represent numbers of cases reported weekly, 1950–51.

FOREIGN REPORTS

CANADA

Reported Cases of Certain Diseases—Week Ended March 3, 1951

Disease	Total	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Brucellosis	7					3	1	1			2
Chickenpox	1,299			36		290	650	34	66	62	161
Diphtheria	4					4					
Dysentery, bacillary	14					2	5				7
German measles	446			48		26	246	1	13	39	73
Influenza	5,977	953		995	590		518	33	999		1,889
Measles	1,754	10		32	3	344	1,136	125	20	43	41
Meningitis, meningococcal	11			2	3		4	2			
Mumps	1,212	2		11		288	402	49	104	249	107
Scarlet fever	307	2			3	100	55	23	6	32	86
Tuberculosis (all forms)	178	14		4	6	79	23	13	7	7	25
Typhoid and paratyphoid fever	7					1					6
Venereal diseases:											
Gonorrhea	274	5		13	9	77	39	15	17	27	72
Syphilis	89	3		7	2	45	15	2	6	1	8
Primary	4					1					3
Secondary	7					7					
Other	78	3		7	2	37	15	2	6	1	5
Whooping cough	159			5		49	68	12	6	2	17

NORWAY

Reported Cases of Certain Diseases—December 1950

Disease	Cases	Disease	Cases
Diphtheria	16	Pneumonia (all forms)	4,863
Dysentery, unspecified	4	Poliomyelitis	48
Encephalitis, infectious	3	Rheumatic fever	72
Erysipelas	300	Scabies	988
Gastro-enteritis	1,903	Scarlet fever	77
Hepatitis, infectious	42	Tuberculosis (all forms)	279
Impetigo contagiosa	1,771	Venereal diseases:	
Influenza	18,972	Gonorrhea	136
Measles	692	Syphilis	56
Meningitis, meningococcal	12	Other forms	2
Mumps	59	Weils disease	3
Paratyphoid fever	3	Whooping cough	1,475

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

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.

Cholera

Burma. For the week ended March 10, 1951, six cases of cholera were reported in Moulmein, as compared with four for the previous week. The total number reported for the year to date was 11 cases.

India. During the week ended March 10, 1951, 107 cases of cholera were reported in Calcutta, as compared with 86 for the previous week.

Smallpox

Burma. During the week ended March 10, 1951, smallpox was reported in ports of Burma as follows: Akyab 22 cases, Moulmein 16, Kyaukpyu 14, and Rangoon 8.

French West Africa. For the period February 21–28, 1951, 29 cases of smallpox were reported in Haute Volta, as compared with 50 for the period February 11–20.

India. The smallpox epidemic continues in several ports of India. For the week ended March 10, 1951, cases were reported as follows: Calcutta 680, Madras 130, Bombay 103, and Cocanada 26.

India (French). The incidence of smallpox in Pondicherry is increasing rapidly. Reported cases rose from 42 for the week ended January 6, 1951, to 109 and 215 for the weeks ended February 17 and 24, respectively.

Yugoslavia. During the period January 22–31, 1951, seven cases of smallpox were reported as compared with two for the period January 15–21.

Typhus Fever

Iran. Five cases of typhus fever were reported in Tabriz during the week ended March 10, 1951.