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— **Editorial** —

Nursing in Tuberculosis

The increasing demand for nurses is a constant source of difficulty in tuberculosis control and care. In the next few years we expect to see several thousand new hospital beds for the tuberculous, but the question of who will take care of the patients in these beds remains unanswered. In some hospitals today, as much as 70 percent of "nursing" care is given by untrained workers.

We know that all types of hospitals are short of nurses. The reason the shortage is so disproportionate in the field of tuberculosis, we tell ourselves, is that the schools of nursing do not give enough tuberculosis training. In 1946, only 24 percent of the schools of nursing in the United States offered any undergraduate clinical experience in tuberculosis at all. In most schools very little time is devoted to classroom instruction in tuberculosis and what little instruction there is, is usually scattered among lectures on other subjects. Furthermore, it is hard to find teachers and supervisors trained in tuberculosis nursing because so little emphasis has been given it in the past.

For the most part, the schools are not unaware of the inadequacy of their training in tuberculosis. But understandably, they are unwilling to place their students in hospitals where protective techniques are questionable, and the risk of infection is great, as is the case in many tuberculosis wards and hospitals.

True, tuberculosis is communicable, and there is always danger of infection however many precautions are taken. But too many hospitals and sanatoria fail to provide even rudimentary protection in the form of conveniently located handwashing facilities, adequate supplies of gowns and masks, sterilization equipment, and dust-control measures.

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

In training, in isolation wards, and on communicable disease services, nurses are taught procedures for isolation in dealing with infectious diseases. But in tuberculosis—indeed a communicable disease—teaching and practice are often at variance. In the tuberculosis ward or hospital, the nurse often finds the communicability of the disease treated lightly; and frequently finds doctors disagreeing about protective measures.

There is no doubt that more research in the communicability of tuberculosis and in measures which can be taken to protect all hospital workers against infection is needed. The study of early tuberculous lesions among student nurses now being made under the joint auspices of the Public Health Service and the National Tuberculosis Association is one such program, and we hope that it will bring useful results. The evaluation of BCG as an immunizing agent is another. A study of the effectiveness of gauze masks in protecting rabbits against tuberculous infection was reported by Dr. Lurie and Dr. Abramson in last month's issue of the *American Review of Tuberculosis*.

Some schools of nursing have made energetic and often successful attempts to provide safe surroundings for their girls on tuberculosis service. Quite properly, they do not want to limit their students' experience and their futures by excluding specialties because they are difficult or hazardous. This is encouraging and will result in more nursing care for tuberculous patients.

Lacking any absolute protection against tuberculosis, however, we must make the widest possible application of the communicable disease techniques we already have. Furthermore, we must employ every technique for picking up the earliest manifestations of tuberculous infection among physicians, nurses, and other hospital workers through periodic tuberculin testing and X-ray examination, so that we may define the problem adequately.

As public health officials, members of hospital boards, hospital superintendents, doctors, and nursing educators and administrators, we must arouse ourselves to the necessity for enforcing protective measures. Only after we have made tuberculosis nursing as safe as it can possibly be can we have cause to expect the acute shortage of nurses in tuberculosis to ease; only then can we expect a greater number of nurses to be attracted to the specialty of providing for tuberculous patients the care necessary for complete recovery.

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Tuberculosis Control in the Philippines

Annual Report of the Tuberculosis Control Division, Philippine Public Health Rehabilitation Program, Year Ending June 30, 1948[1]

By LEROY K. YOUNG, *Senior Surgeon* (R)[2] *Public Health Service*

An intensive survey of the war-devastated public-health and quarantine facilities of the Philippines was conducted by the United States Public Health Service during June and July 1945. This survey revealed widespread destruction of all public-health facilities as well as a startlingly high incidence of malaria, tuberculosis, venereal disease, and the dispersal throughout the population of more than 5,000 persons with Hansen's disease, previously segregated in leprosaria. Sanitation was reduced, as a result of enemy occupation and war activities, to a level which constituted a national hazard, especially in the larger cities.

Data collected in this survey were presented to the Congress of the United States, which in December 1945, appropriated $1 million to assist the Commonwealth Government in restoring its public-health facilities and activities. A Philippine Public Health Rehabilitation Program was immediately put into action. Campaigns were started against malaria, tuberculosis, venereal disease, and leprosy. In addition, the rehabilitation of public-health laboratories, all of which had either been destroyed or looted in the war, was begun. The program also called for providing safe water supplies and for restoration of the Philippine Quarantine Service for the prevention of the introduction of cholera, plague, smallpox, and other diseases known to be epidemic in nearby Asiatic ports.

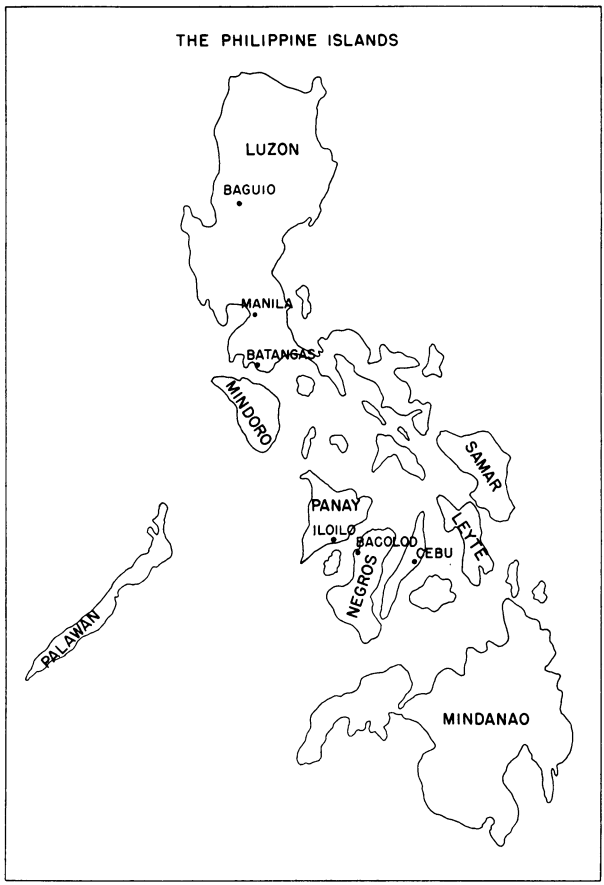
With the passage of the Tydings Act for the general rehabilitation of the Philippines, an additional amount of $5 million was made available to the Public Health Rehabilitation Program, to raise the total of funds for this purpose to $6 million.

The program is being carried out cooperatively by the United States Public Health Service and the Philippine Government. It is directed by Assistant Surgeon General Howard F. Smith of the Public Health Service, but all of the approximately 1,000 employees, with only 3 exceptions, are Filipinos. The program was planned, from the very beginning, in such a way that United States funds could be budgeted

[1] Published by special permission of Howard F. Smith, Assistant Surgeon General, United States Public Health Service, Medical Officer in Charge, Philippine Public Health Rehabilitation Program. In addition, Dr. Young has added material describing the organization of the Philippine Public Health Rehabilitation Program in 1946 and its first year of operation.

[2] Chief, Tuberculosis Control Division, Philippine Public Health Rehabilitation Program.

on a sliding scale downward over a 4-year period with the expectation that the Philippine Government would provide funds on a corresponding sliding scale upwards. At the end of that period the program is to be transferred completely to the Philippine Government.



Tuberculosis Mortality

Pulmonary tuberculosis is the most serious public-health problem in the Philippines. It exists throughout the islands in epidemic form, and it is estimated that 10 percent, or more, of the population suffer from it. The leading cause of death, it is responsible for from 15 to 20 percent of all deaths, and it is one of the leading contributors to the high infant mortality rate. The war not only increased all the predisposing factors, but destroyed most of the islands' means of coping with the disease.

The city of Manila is the only area in the Philippines where vital statistics are reliable. Only about 20 percent of deaths in provincial local-

ities are certified by medical practitioners, while in Manila almost all deaths are reported on certificates signed by attending physicians. These certificates are reviewed by the Manila Health Department and a high percentage are investigated by its inspectors for accuracy of reporting. The health department has a statistical section which compiles and studies the vital statistics of the city.

The data of the Manila health department on tuberculosis mortality are of great importance, for they reveal the extent of the tuberculosis problem in the largest urban community in the Philippines [3] and afford us a yardstick by which to estimate the extent of the problem elsewhere in the islands.

Table 1. *Deaths from tuberculosis (all forms), total deaths from all causes and proportionate mortality from tuberculosis*

City of Manila, January 1–December 31, 1947

Age group (years)	Deaths from tuberculosis (all forms)			Total deaths from all causes			Proportionate mortality from tuberculosis		
	Total	M	F	Total	M	F	Total	M	F
Total	2,359	1,237	1,122	9,873	5,413	4,460	23.9	22.9	25.2
0–4	261	147	114	4,983	2,796	2,187	5.2	5.2	5.2
5–9	54	27	27	288	153	135	18.7	17.6	20.0
10–14	35	19	16	154	90	64	22.7	21.1	25.0
15–19	116	63	53	259	140	119	44.8	45.0	44.5
20–24	227	109	118	427	226	201	53.2	48.2	58.7
25–29	267	125	142	447	227	220	59.8	55.1	64.5
30–34	239	131	108	408	231	177	58.6	56.7	61.0
35–39	280	140	140	488	257	229	57.4	54.1	61.1
40–44	176	99	77	350	209	141	50.3	47.3	54.6
45–49	193	95	98	389	208	181	49.6	45.7	54.1
50–54	132	70	62	274	155	119	48.1	45.2	52.1
55–59	132	63	69	294	155	139	44.8	40.7	49.6
60–64	116	69	47	268	150	118	43.3	46.0	39.8
65–69	63	42	21	188	119	69	33.5	35.2	30.4
70–74	36	21	15	196	102	94	18.4	20.6	16.0
75–79	21	10	11	141	68	73	14.9	14.7	15.1
80+	11	7	4	319	125	194	3.5	5.6	2.1

Unfortunately, however, there is at present no generally accepted figure for the population of Manila and there are no data for age and sex distributions of the population. The last census took place in 1939, and since that time the war has supervened with its profound and unpredictable effects on population movements and on mortality from various causes such as violence, malnutrition, and infectious diseases. Lacking this information, it is impossible to calculate the mortality rate from tuberculosis.

However, there are available data from which the proportionate mortality from tuberculosis may be calculated. This index, expressing the number of deaths from tuberculosis as a percentage of the total number of deaths from all causes (or the number of tuberculosis deaths per 100 total deaths) may be calculated for different ages and

[3] Population of the registration area (Manila proper) is estimated between 600,000 and 800,000 and of Greater Manila between 800,000 and 1,000,000. Population of the Philippine Islands is estimated at 18,000,000.

for both sexes, and is very useful in the absence of population data. It shows us exactly what part tuberculosis plays in the total mortality at each age and in each sex.

The only serious limitation to the usefulness of the proportionate mortality index arises from the fact that it is a ratio and is varied not only by a change in the numerator—number of tuberculosis deaths—but also by a change in the denominator—total deaths from all causes. Thus a significant increase in the number of tuberculosis deaths will be concealed if accompanied by a proportionate rise in mortality from one or more other causes. If the rise in general mortality should be proportionately greater than the increase in tuberculosis deaths, the proportionate mortality index for tuberculosis would actually be a smaller figure.

As a concrete example of this limitation, it is to be noted that for all ages and both sexes tuberculosis was responsible for 23.9 percent of all the deaths occurring in Manila in 1947. Broken down, this percentage starts at 5.2 for 0–4 years, rises steadily to 59.8 for the age group 25–29 years, then declines to the other extreme of the age-group distribution, being only 3.5 percent for the group 80 years and over.

The point which it is desired to make is that the proportionate mortality figures conceal entirely the magnitude of infant and child mortality from tuberculosis because of the accompanying high mortality from other causes in the same age group.

The index figure of 5.2 for the 0–4 year age group, compared with that for other ages, appears low until we observe that there were 261 tuberculosis deaths in this age group out of a total of 2,359 for all ages, which is to say that 11.1 percent of all tuberculosis deaths occurred under the age of 5. The reason this high mortality does not reflect itself in the proportionate mortality index is the enormous figure for general mortality in the same age group. Out of a total of 9,873 deaths from all causes, 4,983 or 50.5 percent occurred under the age of 5 years. This distorts the index for tuberculosis deaths.

If this extremely high mortality from nontuberculous causes in this age group could be reduced, other things being equal, the proportionate mortality from tuberculosis would rise to its true magnitude to reflect the seriousness of infant and child mortality from tuberculosis.

The indices for the age groups over 0–4 years need no qualifying remarks. They serve to show clearly the seriousness of tuberculosis as a cause of death in all ages in the Philippines. It is to be noted that, with 4,890 deaths occurring from all causes in persons 5 years of age and older, tuberculosis was responsible for 2,098 or 42.9 percent.

The available figures for tuberculosis mortality in Manila in 1947 are shown in striking perspective when compared with similar figures for the United States for the year 1946, the latest year for which

complete data for the United States are available. The figures show that in the United States tuberculosis is responsible for approximately 1 death in 28, but it is the cause of almost 1 in 4 in Manila.

	U. S. 1946	*Manila 1947*
Number of deaths from all causes (both sexes, all ages)	1, 395, 617	9, 873
Number of deaths from tuberculosis, all forms (both sexes, all ages)	50, 911	2, 359
Proportionate mortality from tuberculosis, all forms (both sexes, all ages), percent	3. 65	23. 9

The second group of figures shows the extraordinarily high rate of infant and child mortality in Manila where more than one-half of all deaths occur in children under 5 years of age. In the Unites States the corresponding figure is less than one-tenth.

	U. S. 1946	*Manila 1947*
Number of deaths from all causes (both sexes, 0–4 years)	130, 742	4, 983
Percentage of deaths from all causes (both sexes, 0–4 years) to deaths from all causes (both sexes, all ages)	9. 4	50. 5

Figures show the high rate of tuberculosis mortality in infants and young children in Manila where one-ninth of all the tuberculosis deaths occur in children younger than 5 years of age. In the United States, the corresponding figure is slightly greater than one thirty-ninth.

	U. S. 1946	*Manila 1947*
Number of deaths from tuberculosis, all forms (both sexes, 0–4 years)	1, 300	261
Percentage of deaths from tuberculosis, all forms (both sexes, 0–4 years) to deaths from tuberculosis, all forms (both sexes, all ages)	2. 6	11. 1

As this is written, preparations are being made for a new census in the Philippines. When the results are reported, it will be possible to calculate age and sex specific mortality rates from tuberculosis to supplement the information gained from the determination of proportionate mortality indices.

Rehabilitation Program

Because of the magnitude of the tuberculosis problem and the limited means available to the Philippine Government for combatting it, the rehabilitation program is aimed primarily at preventing the spread of tuberculosis rather than at treatment of individuals. Sanatorium facilities are few in the Philippines, and it is thought wiser to discover and treat early cases in clinics than to emphasize care for far-advanced cases in sanatoria. Major parts of the plan call for training of doctors and nurses and an intensive health-education program in tuberculosis control methods both for doctors and for the general public.

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In the first full year of the program—fiscal 1947—activity was primarily restricted to Manila because, as an established medical center, it could provide training for the medical, nursing, and technical people who were to take part. Also, there was not enough equipment to start the program in other places.

The chief accomplishment of the first year was the construction of a National Chest Center within the grounds of the San Lazaro Hospital to serve as headquarters of the program. The center consisted of two sections: One, composed of three quonset huts, houses the administrative center, the training center, the central laboratories, and dark room. The other, a single quonset, holds the fluoroscopic and pneumothorax sections.

A second accomplishment was the development of a control program for Manila which used the facilities and services of the Philippine Department of Health, the Manila Health Department, the Philippine Tuberculosis Society, the White Cross Preventorium, and the United States Public Health Service.

In fiscal 1947, plans were also made for the establishment of six units, patterned after the Manila center, in six provincial capitals under the auspices of the joint cooperative program.

In fiscal 1948, the Tuberculosis Control Division of the Rehabilitation Program, working in close coordination with the Tuberculosis Control Section of the Philippine Department of Health, the Manila Health Department, the district health officers for the Provinces of Occidental Negros and Batangas, the city health officer of Baguio, the Philippine Tuberculosis Society, and the White Cross Preventorium, continued and expanded the activities of the preceding year.

National Chest Center

The National Chest Center found its clinical and administrative facilities seriously overtaxed soon after its inauguration because of the great number of persons attending the various clinics. Average monthly attendance in 1946–47 was 10,929, and during 1947–48 was 16,754. Other activities also helped to increase the strain upon the center; the activation of a traveling unit for schools and colleges; the opening of the city hall chest clinic; the inauguration of BCG work, and the extension of the program from Manila to several provincial localities. Accordingly, the facilities of the center as originally constructed became inadequate for coping with the volume of clinical and administrative work which has developed and steadily increased since the center was opened.

A plan was devised for erecting a two-story semiconcrete building near the other buildings of the center with space for a 10-unit chest clinic, a BCG clinic, a library and conference room, and offices for

the chiefs of sections of the program. The cost of construction, approximately $40,000, was borne by the Department of Health while the equipment was purchased with rehabilitation funds at a cost of approximately $20,000.

This new building was officially inaugurated on May 28, 1948. Also during the year, two 20- by 40-foot quonset hut warehouses were constructed at the National Chest Center for the storage of supplies and equipment.

From July 1, 1947, to June 30, 1948, the clinics of the National Chest Center were in operation 306 days with a total clinic attendance of 201,049 patient-visits.[4] The enlargement of the center permitted improvements and innovations in all three of the broad categories of service—administration, clinical work, and training. There was increased office space for the staff and it was possible to organize an education and publicity section, an immunization and prophylaxis section, and a statistical section.

In the clinic, 10 much-needed examination and treatment rooms were opened. Previously, interviews with new patients were carried out in one large room, with no privacy for adequate physical examinations or treatments. A BCG vaccination clinic was opened, with laboratory facilities for testing and controlling vaccines. An operating room was made available for minor surgical chest operations. The waiting room for the X-ray clinic was enlarged and provided with seats for 50 people. Previously, persons awaiting examination had to stand outside the building, protected in the rainy season only by a tarpaulin.

During the year, the center was used not only for training the program's own personnel, but also for the instruction of physicians and technicians from private clinics, business concerns, and Philippine Government agencies outside the Department of Health. For example, the medical officer in charge of the Batangas Provincial Chest Clinic was given a refresher course. The X-ray technician of the Baguio Municipal Chest Center was sent down from Baguio to undergo training. Two physicians of the Manila Railroad Co. were given a course in X-ray interpretation, as were several United States Army medical officers. At this time several officers and technicians of the Philippine Army are undergoing a course of training. Physicians of the department of pediatrics at the Philippine General Hospital and at the hospital of the University of Santo Tomas were taught the approved methods of inoculating with BCG.

In order to staff the expanded program, a second [5] group of 14 medical officers was chosen for training after careful screening and a competitive written examination. The officers were given a

[4] For complete figures on operations of this and all clinics in the Philippines see tables 1, 2, 3, and 4.

[5] The first group, consisting of 20 doctors engaged to work in the tuberculosis control program, were trained in fiscal 1947.

6-months' course of instruction in all phases of tuberculosis control and treatment and, since April 1948, have been given regular assignments in the various clinics of the program.

At the end of the fiscal year this division had in its employ 28 medical officers and 1 medical field supervisor. The maximum during the year was 35 medical officers and 1 medical field supervisor. At the end of the year 3 of the first group of medical officers were scheduled to depart for the United States to undertake a 1-year course of advanced training in public-health phases of tuberculosis as United States pensionados. Upon completion of this training they are expected to return to their posts in the program.

BCG Vaccination Project

Under present circumstances in the Philippines, where the number of active and infectious tuberculosis cases is far greater than can be accommodated by available facilities for treatment and isolation, the eventual control of the disease must depend primarily on preventing the development of new cases by increasing the resistance of susceptible persons to infection. Vaccination with BCG is the only widely accepted procedure for achieving this by specific means, and the introduction of BCG vaccination into widespread use in the Philippines has been one of this Division's main objectives from the beginning of the rehabilitation program.

In October 1947, the immunization and prophylaxis section was created. One of its first tasks was to carry out a tuberculin-testing survey to ascertain the percentage of positive and negative reactors in different age groups of the population as a guide to the selection of the most advantageous age groups on which to concentrate our efforts.

It was found, after a survey of 5,448 elementary school pupils, that 48–55 percent of those entering school at the age of 6 were already positive to tuberculin, and that these percentages rapidly rose to 100 percent by the time the 18th year was reached.

Such figures, taken into consideration with the high infant mortality from acute forms of tuberculosis, bespeak massive exposure of infants and young children to tuberculosis, and indicate that a BCG vaccination project must seek to inoculate children as soon after birth as possible. Accordingly, the vaccination project will aim primarily at the inoculation of infants in maternity hospitals, nurseries, well-baby clinics, and other preschool groups, as well as the first few grades of elementary school.

Because of uncertainty about the date when supplies of BCG could be received from the United States, this Division arranged, through the French Minister to the Philippines, for the Pasteur Institute in

Paris to ship BCG by air to the Philippines at regular intervals. Early in January 1948, the first shipment was received of a dried vaccine certified to be viable for 3 months after the date of preparation. This material was carefully tested for nonpathogenicity and viability at the Alabang Serum and Vaccine Laboratories, and specimens were sent to the National Institute of Health of the Public Health Service for similar tests. The findings were that the material was safe, that the organisms were viable, and that tuberculin-negative guinea pigs inoculated with them developed positive tuberculin reactions.

At present, BCG vaccinations are being done on a voluntary basis at the National Chest Center, the nursery and pediatrics clinic of the Philippine General Hospital, the White Cross Preventorium, the Children's and Maternity Hospital, and a few other institutions. The project is still on a small scale in order to enable our physicians to develop a satisfactory technique, to observe and learn to manage the different types of reactions, and to develop public confidence before embarking on a large-scale project.

By the end of June 1948, a total of 1,789 vaccinations had been done. Of these, only 459 returned for post-vaccination follow-up. On the sixtieth day after vaccination, 58.8 percent of those vaccinated and followed up had developed positive tuberculin tests. With improvements in technique, the percentage of tuberculin convertors has, since June 1948, been increased to more than 80 percent.

Education and Publicity Section

In the present state of the antituberculosis movement in the Philippines, a very important role is performed by the dissemination of information concerning modern methods of tuberculosis control to public health workers, practicing physicians, tuberculous patients, and the general public.

During fiscal 1947, activities of this kind were carried out by the headquarters office as part of its functions, the writer personally writing newspaper releases, operating a motion-picture projector, delivering lectures, etc. During the past fiscal year, however, the volume of work became too great, and in November 1947, the education and publicity section was created under the supervision of a physician who has had many years of experience in health education and public relations work.

Since its organization, this section has prepared newspaper releases about our activities, distributed pamphlets and posters obtained from the National Tuberculosis Association in New York, prepared and printed—in several Filipino dialects as well as English—material for lay distribution concerning tuberculin testing, BCG vaccination, home

care, and related subjects. It has arranged exhibitions of medical motion pictures to medical and nursing students, medical meetings and lay groups, and has prepared and distributed to physicians the first number of a periodical, "Recent Advances in Diseases of the Chest," and arranged for medical officers to address medical and lay groups on subjects relating to tuberculosis.

Other Clinics in Manila

The Manila Health Department in April 1947 created a tuberculosis control section within its organization in order to participate in this Division's tuberculosis control program. Since that time, with the Division's financial and technical support this section has developed steadily into one of the most effective and important units of the program.

Table 2. *Summary of clinic activities, July 1947–June 1948*

Name of clinic	Total number of working days	Total number of clinic visits
National Chest Center, Manila	306	201, 049
Tondo Chest Clinic, Manila	306	27, 784
City Hall Chest Clinic, Manila	152	35, 878
Traveling X-ray Unit, Manila	130	15, 687
Occidental Negros Chest Clinic, Bacolod, Occidental Negros	254	23, 943
Batangas Chest Clinic, Batangas	201	6, 680
Baguio Chest Clinic, Baguio	187	7, 623
Cebu Chest Clinic, Cebu (Philippine Tuberculosis Society)	255	18, 999
Iloilo Chest Clinic, Iloilo (Philippine Tuberculosis Society)	255	23, 750
Total	2, 046	361, 393

The tuberculosis control activities of the Manila Health Department in the beginning consisted only in the operation of the home visiting nursing service for the instruction of patients in home care and for the investigation and instruction of the home contacts of tuberculosis cases. All cases and contacts were referred to other clinics for diagnostic study and treatment, while records on all were maintained at the city hall.

It was soon found, however, that under this arrangement the difficulties in the way of rapid interchange of information between clinics made it impossible for the nursing service to operate efficiently. It was decided to establish a chest clinic in the city hall to be operated by the Manila Health Department and to function in close cooperation with the nursing service. The original concept was for this

clinic to examine the contacts of reported cases and deaths; to examine the cases themselves as part of public-health supervision if they failed to be followed by their own physicians or clinics; to examine food handlers, barbers, and other applicants for health cards as prerequisite for employment, and to examine school teachers and other city employees. Treatment facilities were to be limited, and therapeutic measures, except for the simplest, were to be provided by larger clinics.

The plan was carried out. The city hall chest clinic opened on January 2, 1948. From the opening through June 1948, it operated 152 days, had 36,000 patient-visits and made 27,000 small film examinations—which discovered 1,584 cases of definite tuberculosis, 2,109 cases of suspected tuberculosis, and 1,008 cases of nontuberculous pathology.

The home visiting nursing service, begun during the fiscal year 1947, has been continued during the present year with a total of 62,396 visits. The follow-up work of the nurses has been made more effective and systematic by the institution of a central case register.

Tondo Chest Clinic, situated in the most congested part of Manila's poorest section, operated 306 days, had 27,784 visits, made 11,861 small film examinations, 1,217 fluoroscopic examinations of new cases, and 543 fluoroscopic examinations of old cases. It discovered 929 cases of definite tuberculosis and 2,046 of suspected tuberculosis.

School and College Surveys

During the past fiscal year, considerable progress was made in conducting chest X-ray surveys of students of colleges and universities in Manila. A survey of 17,818 students from the three largest universities was completed and the results analyzed and charted.

Summarizing the findings briefly, it may be said that 4.5 percent of all the students examined had definite tuberculosis while another 1.4 percent had lesions suspected but not proved to be tuberculous.

Of the cases of definite tuberculosis, 74.2 percent were minimal, 21.8 percent were moderately advanced, while only 4.0 percent were far advanced. Again, for the cases of definite tuberculosis, 55.2 percent were active, 28.2 percent had questionable activity, while 16.6 percent were considered probably inactive.

These figures, derived from a survey of more than one-fifth of Manila's college population and therefore reflecting conditions among the group as a whole, demonstrate the reasons why this activity may be considered one of the most fruitful in our program. It gave a high yield of definite cases in an organized, intelligent, and cooperative group. As a consequence, case-finding is administratively facilitated while follow-up and treatment have almost 100 percent cooperation. The high percentage of minimal and moderately advanced cases

Table 3. *Summary of case-finding activities, July 1947–June 1948*

Name of clinic	Number of small film examinations	Small-film diagnoses				Number of fluoroscopic examinations of new cases	Fluoroscopic diagnoses			
		Tuberculosis	Suspected Tuberculosis	Nontuberculous pathology	Negative		Tuberculosis	Suspected tuberculosis	Nontuberculous pathology	Negative
National Chest Center, Manila	55,850	3,552 6.4%	5,994 10.7%	938 1.7%	45,366 81.2%	37,943	5,696 15.0%	0 0	5,716 15.1%	26,531 69.9%
Tondo Chest Clinic, Manila	11,861	710 6.0%	2,046 17.2%	1,095 9.2%	8,010 67.6%	1,217	219 18.0%	0 0	339 27.9%	659 54.1%
City Hall Chest Clinic, Manila	27,234	1,584 5.9%	2,109 7.7%	1,008 3.7%	22,533 82.7%	----------	----------	----------	----------	----------
Traveling X-ray Clinic, Manila	14,722	315 2.1%	961 6.5%	333 2.3%	13,113 89.1%	----------	----------	----------	----------	----------
Occidental Negros Chest Clinic, Bacolod	15,750	1,240 7.9%	1,074 6.8%	347 2.2%	13,089 83.1%	770	142 18.4%	0 0	112 14.5%	516 67.1%
Batangas Chest Clinic, Batangas	2,554	289 11.3%	364 14.3%	122 4.8%	1,779 69.6%	1,534	85 5.5%	106 6.9%	23 1.5%	1,320 86.1%
Baguio Chest Clinic, Baguio	----------	----------	----------	----------	----------	6,271	218 3.5%	69 1.1%	230 3.7%	5,754 91.7%
Cebu Chest Clinic, Cebu (Philippine Tuberculosis Society)	----------	----------	----------	----------	----------	7,493	718 9.6%	204 2.7%	1,813 24.2%	4,758 63.5%
Iloilo Chest Clinic, Iloilo (Philippine Tuberculosis Society)	----------	----------	----------	----------	----------	11,805	2,023 17.1%	1,968 16.7%	5,731 48.5%	2,083 17.6%
Total	127,971	7,690 6.0%	12,548 9.9%	3,843 3.0%	103,890 81.1%	67,033	9,101 13.6%	2,347 3.5%	13,964 20.8%	41,621 62.1%

makes treatment less expensive in time and money and insures a majority of permanently arrested lesions. The high percentage of active disease in conjunction with the high percentage of minimal lesions is a compelling call to action.

Timely intervention while the students are in college will, in most cases, enable them to finish their work and begin their careers with health restored. Failure to find them, on the other hand, will mean that most of them will progress to far-advanced disease and break down after graduation and after assuming professional and family obligations that make it difficult or impossible to undertake treatment.

It is, of course, probable that the same percentages of infection exist among young people of the same age not attending college, and therefore the same work should be done among them. In the beginning, however, while facilities and personnel are yet limited, it is more advantageous to work in the schools where the surveys are administratively easier, with a group of young people who are destined to be the nation's future leaders. Eventually, however, these activities should be extended to include all young men and women of the age group 18–30 years.

At present, the majority of cases found in the schools are referred to our regular chest clinics for follow-up and treatment if they do not have private physicians. This is the only possible arrangement, but it is not a satisfactory one, because it is psychologically bad to have these early, asymptomatic cases mingling with the far-advanced and sick patients at the clinics. Adequate and appropriate attention can very rarely be given to the students at these clinics because the management of asymptomatic cases is very different from the main activity of the clinics, which is the care of moderately advanced cases undergoing pneumothorax treatment and other therapeutic measures.

It is still one of this Division's main objectives to see a college chest clinic in operation which will X-ray all new matriculates in Manila colleges, re-X-ray all students at least once every 2 years and provide all follow-up and treatment for those needing them. It is felt that no other antituberculosis activity would return so much benefit for the time and money spent, with the possible exception of BCG vaccination. Such a clinic could serve as a demonstration and model for the eventual spread of similar clinics to other parts of the islands.

During the first surveys, this Division encountered a great deal of difficulty in securing adequate and satisfactory electric power to operate the X-ray apparatus, and in achieving satisfactory dark-room facilities for processing films under field conditions. In January 1948, however, the Division engaged an X-ray engineer and an automotive truck expert to design a compact traveling X-ray unit consisting of a 25 kilovolt-ampere generator and a completely equipped dark-room mounted on a truck which also provided space for loading a trans-

Table 4. *Summary of diagnostic activities (exclusive of case-finding), July 1947–June 1948*

Name of clinic	X-Ray		Laboratory examinations									
	Fluoroscopic examinations of old cases	14" x 17" X-ray films	Total	Sputum examinations	Blood examinations	Urine examinations	Stool examinations	Pathological specimens	Sedimentation rates	Gastric washings	Specimens cultured	Guinea pig inoculations
National Chest Center, Manila	24,158	4,409	21,783	17,693	1,282	1,820	231	350	254	0	127	26
Tondo Chest Clinic, Manila	543	1,675	1,016	923	31	54	8	0	0	0	0	0
City Hall Chest Clinic, Manila	0	1,420	Specimens sent to National Chest Center laboratory or Manila Health Department laboratory.									
Traveling X-ray Unit, Manila	0	906	Specimens sent to National Chest Center laboratory.									
Occidental Negros Chest Clinic, Bacolod, Occidental Negros	2,054	794	940	940	0	0	0	0	0	0	0	0
Batangas Chest Clinic, Batangas	161	505	452	452	0	0	0	0	0	0	0	0
Baguio Chest Clinic, Baguio	133	358	372	310	42	13	7	0	0	0	0	0
Cebu Chest Clinic, Cebu (Philippine Tuberculosis Society)	2,733	217	0	0	0	0	0	0	0	0	0	0
Iloilo Chest Clinic, Iloilo (Philippine Tuberculosis Society)	10,676	0	5	2	0	2	1	0	0	0	0	0
Total	40,458	10,284	24,568	20,320	1,355	1,889	247	350	254	0	127	26

portable 70-millimeter X-ray unit. Because of the greater size of truck required and the poor condition of the streets and roads of the Philippines, it was decided not to build a unit in which the complete X-ray apparatus is permenently mounted, although such a unit would be more desirable because of the convenience of not having to dismantle and assemble the X-ray apparatus at each site of examination. With well-trained personnel, however, the dismantling and assembling of our units take less than 1 hour.

In June 1948, this traveling X-ray unit was delivered. Preliminary testing and small surveys under field conditions have shown that it is very efficient and entirely satisfactory. During the coming year many surveys will be completed with it.

Provincial Clinics

Early in the past fiscal year, when plans for establishing chest clinics in the provinces with rehabilitation funds were being considered, it was decided that because of the comparatively short life-span of the rehabilitation program such clinics would have little chance of becoming permanent unless the local communities and governments were actively interested in maintaining them after cessation of aid from the United States. Accordingly, the policy was established that provincial governments should take such a large part in establishment and maintenance that the clinics would be self-sufficient by the time the rehabilitation program ended.

The Occidental Negros chest clinic in Bacolod City was opened on September 1, 1947, as the first of such provincial chest clinics established. It was completely equipped with a 70-millimeter photo Roentgen unit, with a 60-milliampere fluoroscopic-radiographic unit, with dark-room and clinical laboratory facilities and with office equipment. The Division assigned one medical officer and one X-ray technician to this clinic while the tuberculosis control section of the Department of Health assigned another medical officer and one laboratory technician. The Provincial government supplied a number of clerks, nurses, guards, and janitors. Opened September 1, 1947, this clinic was in operation for 254 days and had 23,943 visits. It made 15,750 small-film examinations, 770 fluoroscopic examinations of new cases and 2,054 of old cases. It discovered 1,382 cases of definite tuberculosis and 1,074 cases of suspected tuberculosis.

At the end of the fiscal year the Provincial government had received $20,000 from the Department of Health to cover the cost of a new chest clinic building, construction of which is expected to start during the coming year. It is planned to increase the scope of activities centering around this clinic as part of a general public-health

Table 5. *Summary of treatment activities, July 1947–June 1948*

Name of clinic	Pneumothorax				Other operations				
	Total number of pneumothorax treatments	Number of patients receiving treatments	Number of initial treatments	Number of refill treatments	Thoracentesis	Phrenic operations	Thoracoscopy	Pneumonolysis	Thoracoplasty stages
National Chest Center, Manila	11,673	3,442	158	11,515	245	10	0	0	4
Tondo Chest Clinic, Manila	565	186	31	534	13	0	0	0	0
City Hall Chest Clinic, Manila	Patients referred to other clinics for treatment.								
Traveling X-ray Unit, Manila	Patients referred to other clinics for treatment.								
Occidental Negros Chest Clinic Bacolod, Occidental Negros	2,772	1,435	60	2,712	102	0	0	0	0
Batangas Chest Clinic, Batangas	186	40	21	165	0	0	0	0	0
Baguio Chest Clinic, Baguio	149	38	6	143	1	0	0	0	0
Cebu Chest Clinic, Cebu (Philippine Tuberculosis Society)	243	26	12	231	1	0	0	0	0
Iloilo Chest Clinic, Iloilo (Philippine Tuberculosis Society)	808	64	29	779	11	0	0	0	0
Total	16,396	5,231	317	16,079	373	10	0	0	4

demonstration in which all the other divisions of the public-health rehabilitation program will join.

Working conditions in Bacolod have been fairly good during the past year. There is electricity during the entire day and water is available during most of the morning.

In November 1947, the Batangas provincial chest clinic in the city of Batangas was opened to the public. During the first few months the clinic operated with fluoroscopic apparatus only, since a 70-millimeter photofluorographic unit could not be made available until January 1948.

The Batangas chest clinic occupies a whole building newly renovated by the Provincial government. It is one of the best clinics of the program. Unfortunately, however, shortly after the clinic was inaugurated, an electric-power shortage developed so that electricity is now available only for 1 or 2 hours a day, preventing the clinic from working to full capacity. In addition, water has to be brought to the clinic in barrels because of low pressure in the mains. No effort is being spared to solve these difficulties. If the electrical shortage continues, a generator may have to be sent to this clinic.

The Batangas clinic has been open for 201 days and has had 6,680 visits. It has made 2,554 small-film examinations and 1,534 fluoroscopic examinations of new cases. Of those examined, 374 have proved to have definite tuberculosis and 470 are suspected of having the disease.

The Baguio municipal chest clinic was established under the same general policy governing provincial clinics, except that our agreement was with the city of Baguio rather than with the Provincial government. This clinic was equipped with a fluoroscopic and radiographic unit only, as the size of the population did not justify the purchase of a 70-millimeter photofluorographic unit. It has made 6,271 fluoroscopic examinations of new cases and has found 218 definite and 69 suspected cases.

Up to the last 2 months of the past fiscal year, this Division cooperated with the Philippine Tuberculosis Society in the operation of its chest clinics in the cities of Cebu and Iloilo. These clinics were enabled to resume activities after the war when this Division issued to each of them a fluoroscopic-radiographic unit and other accessory equipment. The Division did not send any of its own personnel and had little jurisdiction over their administration as it was felt that the Philippine Tuberculosis Society was capable of administering them satisfactorily. It was reported that Cebu made 7,493 fluoroscopic examinations of new cases and found 718 cases of definite tuberculosis and 204 suspects. Iloilo made 11,805 examinations of new cases of whom 2,023 were definitely tuberculous and 1,968 suspected.

In May 1948, the relationship with the Philippine Tuberculosis Society was terminated when the Society was able to purchase new equipment and to return the borrowed equipment to this Division. Our liaison with the Philippine Tuberculosis Society for correlation of activities and interchange of information will continue as before.

It is hoped that all these activities may be continued in fiscal 1949, in order that the Tuberculosis Control Program of the Philippines may be firmly established before the termination of United States aid in 1950.

Pneumonectomy Followed by Immediate Thoracoplasty

—Preliminary Report of Three Cases [1]—

By ROLAND K. IVERSON, M. D.[2] and HOMER L. SKINNER, M. D.[3]

Pulmonary resection is rapidly assuming its proper place in the treatment of pulmonary tuberculosis. The lower morbidity and mortality rates of recently reported series of cases reflect the amazing progress which has been made in this field of surgery. As is often the case with a radically new procedure, however, certain inherent undesirable features have presented themselves which were not at first apparent. The encouraging early results of resection have often given way to extreme pessimism in the face of late spreads of disease in the contralateral lung following pneumonectomy, and in the ipsilateral portions of the remaining lung following lobectomy. Bronchial fistulas and tuberculous or mixed empyemas are not uncommon. Overdistention of the contralateral lung resulting in reduced respiratory efficiency and reactivation of quiescent tuberculous foci have been particularly discouraging in the pneumonectomy cases. Only by increasing experience in selection of cases, improved surgical techniques, and antibiotic therapy, have many of these undesirable features been eliminated. In order to circumvent the complications resulting from overdistention of the remaining lung, it has become routine practice in most thoracic clinics to follow pneumonectomy by one or two stages of thoracoplasty, and upper lobectomy by a single stage thoracoplasty.

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Our interest in pulmonary resection for tuberculosis is relatively recent. In a limited series of cases we have noted the more benign course of post-thoracoplasty resections as compared to those who had had no previous thoracoplasty—this, despite the increased technical difficulties of the procedure itself. We also encountered one patient who refused a post-resection thoracoplasty. Despite this patient's present excellent condition, we definitely feel that his future health is jeopardized by his refusal to submit to thoracoplasty. In only one patient have we encountered bronchial fistula and empyema. This condition occurred 3 weeks after operation in a patient who had left pneumonectomy for severe bronchial stenosis. Despite intensive therapy, the patient died. It is our opinion that the procedure to be described would greatly reduce or prevent occurrence of this distressing complication.

We report the cases of three patients upon whom total pneumonectomy and thoracoplasty were performed as a single operation. Two of these resections were for pulmonary tuberculosis, and one for pulmonary cyst and multiple lung abscesses with emphysema in the contralateral lung. In all of these cases, post-pneumonectomy thoracoplasty would ordinarily have been indicated.

This is intended as a preliminary report only, and is believed to be the first report of this combined procedure.

It seems appropriate to include a few pertinent details of pre-operative management, as well as of technical considerations.

Pre-operative management—Tuberculous patients received streptomycin for 1 to 2 weeks, and penicillin for 24 hours before surgery. Premedication consisted of Nembutal gr. 1½ one and one-half hours before operation, and morphine sulfate gr. ¼ and atropine sulphate gr. $\frac{1}{150}$ one hour before surgery.

Position on table and anesthesia—These patients were operated upon in the face-down position with the sound lung uppermost as advocated by Overholt (*1*). The advantages of this position have been enumerated by Overholt and others, but certain features deserve re-emphasis. Two of our three patients had a frozen lung. In the usual lateral position, a great deal of lung manipulation is necessary to expose the hilus in such cases, and there is very real danger of direct spread to the opposite lung. In the face-down position, however, minimal manipulation and dissection is necessary to expose and occlude the bronchus as a preliminary step. As a consequence, cavity-bearing areas, particularly in the apex, need not be mobilized until the bronchus has been occluded, thereby greatly lessening the danger of contralateral spread.

It was also our impression in these and other cases operated upon in the face-down position, that the incidence of shock was lessened as

well as the occurrence of cardiac arrhythmias. To further combat the latter, intravenous procaine was used prophylactically.

Cyclopropane, oxygen and ether were the anesthetic agents used. The patient was put in position on the face-down table as soon as the intratracheal tube had been placed and the course of anesthesia was proceeding smoothly. Intratracheal aspirations were carried out frequently.

Operative technique—Exposure for the combined pneumonectomy and thoracoplasty was obtained through a long postero-lateral incision, the proximal limb being carried somewhat higher than in the usual incision for pneumonectomy alone. We have made a practice of incising both skin and muscles close to the spinous processes, a procedure similar to that recommended by Brock (*2*), which permits both raising and closure of the trapezius and rhomboid muscles as a single layer. Blood loss also appears to be minimized since the posterior branches of the intercostals can be visualized and ligated before division.

The pleural cavity was entered through the periosteal bed of the sixth rib, following resection of generous segments of ribs 5 and 6 and the splitting of ribs 4 and 7 paravertebrally. The intervening intercostal nerves and vessels were doubly ligated and divided. Before insertion of the rib spreader, the lung was freed from the chest wall above and below the periosteal incision. In two of our cases, pleural symphysis necessitated beginning the dissection in the endothoracic plane. The intrapleural plane was entered as soon as feasible, and adhesions were severed by sharp dissection.

As previously noted, the posterior aspect of the hilus was exposed as quickly as possible. The bronchus was then freed from the surrounding tissues and a right angle clamp placed distally. Several 2–0 intestinal cotton sutures on an atraumatic needle were then placed high on the bronchus. These sutures were tied over the bronchial stump as the bronchus was being cut proximal to the clamp. This method traumatized the bronchus little and reduced to a minimum contamination of the pleural cavity and loss of anesthetic agent. No mattress sutures were used in any case since an attempt was made to amputate the bronchus as high as possible. This type of amputation permitted the stump to retract deeply into the mediastinum and facilitated its covering with mediastinal pleura.

The pulmonary vessels were then treated in the usual manner—the artery being ligated and divided first, then the veins. Reinforcing transfixion ligatures were used proximally, but distally only single ligatures or an Ochsner clamp were used to permit leaving a large cuff.

When the division of the hilar structures was completed, the lung was then freed from its remaining attachments to the chest wall and mediastinum. Insofar as possible, care was taken to avoid breaking

into thin-walled cavities, and over these areas dissection was carried out in the endothoracic plane. This precaution particularly applied to large apical cavities. Bleeding from the raw chest wall was easily controlled by warm saline packs. If at all possible, however, we preferred to sever adhesions intrapleurally to minimize blood loss.

The phrenic nerve was routinely interrupted, be it a right or left pneumonectomy.

Upon removal of the lung, the bronchial stump was covered with mediastinal pleura mobilized to whatever degree necessary to permit closure without tension.

At this point the patient's condition was carefully evaluated. If it was considered satisfactory, thoracoplasty was immediately performed. Generous posterior segments of ribs 4, 3, 2, and 7 were resected in that order—ribs 5 and 6 having previously been removed. The transverse processes and posterior rib stumps were not resected. Rib 1 was left intact. In our second case, a 21-year-old male, rib 2 was also left in situ but the intercostal structures were freed from its medial surface and allowed to fall inward. It was our intention to preserve the normal chest and shoulder contours insofar as possible and yet permit adequate obliteration of the pleural space.

It should be noted that only about 20 minutes additional operating time was necessary to perform the thoracoplasties. Even after such a formidable procedure as pneumonectomy, the addition of thoracoplasty did not produce shock or even an appreciable fall in blood pressure in any of these patients. It appears that performance of the additional operation at this time is not as shocking a procedure in itself, as when it is performed over a closed and fairly rigid pleural space 4 to 6 weeks after pneumonectomy.

After thoracoplasty, the pleural cavity was thoroughly irrigated with saline and a No. 24 catheter inserted through a stab wound in the eighth intercostal space and posterior or midaxillary line. The catheter was held in position against the posterior chest wall by a fine catgut suture encircling its tip.

The intercostal structures, muscles, subcutaneous tissue, and skin were next approximated with interrupted cotton sutures, and a lightweight but snug dressing applied. One gram of streptomycin and 100,000 units of pencillin were instilled through the catheter and the catheter clamped.

The patient was then immediately placed on his back and the tracheobronchial tree thoroughly aspirated. In none of the following cases was postoperative bronchoscopy necessary. We have abandoned the practice of routine postoperative bronchoscopy for this type of case as well as for others after major thoracic operations. Bronchoscopy is reserved for those patients who continue to be "wet" after

intratracheal aspiration, or who demonstrate any evidence of airway obstruction. We feel that it unnecessarily prolongs anesthesia, and is no more effective than properly performed intratracheal aspiration with a catheter.

The anesthetic agent was discontinued during the skin closure and a mixture of helium and oxygen administered. This mixture thoroughly removed the anesthetic agent from the lungs and facilitated the patient's early reaction after operation. The intratracheal tube was replaced by an oropharyngeal airway as soon as the patient started to react. Nasal oxygen was started immediately.

Blood was administered during the operative procedure in amounts up to 1,500 cc. and continued after operation up to 2,000–2,500 cc. A 500 cc. transfusion was usually given on the first postoperative day.

General postoperative considerations—The same general principles applied to these patients as to others who have undergone major thoracic surgery. Only a few points will be emphasized.

Semi-Fowler's position and frequent turning were important to permit maximum pulmonary ventilation. Sedation in adequate amounts to control pain was necessary, and the patient was urged to cough and raise sputum at regular intervals. Coughing was greatly increased by having the patient sit up and applying pressure over the operated side. This could usually be started on the evening of the day of operation.

It has been noted that these patients had less dyspnea and coughed more effectively in the early postoperative period than patients who have had pneumonectomy alone. This favorable reaction was attributed to the weight of the scapula and the pressure dressing over the decostalized area which rendered the mediastinum relatively stable.

The pleural catheter was attached to the Stedman suction apparatus 4 hours after operation. Suction of −10 cm. of water was maintained continuously for approximately 48 hours, except for 4 hours on the first postoperative day following the instillation of 1 gram of streptomycin and 100,000 units of penicillin. These antibiotics were again instilled just before removal of the catheter. No aspirations were necessary in any of the patients following removal of the catheter.

Early ambulation was practiced, and patients were urged to move about as much as possible after removal of the catheter and change of dressing on the second postoperative day. Sutures were removed on the sixth postoperative day. A pressure dressing, however, was maintained for 2 to 3 weeks or until the chest wall had become firm.

The following case reports illustrate the unusually benign postoperative course of three patients who have had total pneumonectomy and thoracoplasty performed at a single operation:

Case 1: N. P., colored male, 33 years of age. Admitted April 16, 1948, following prolonged hospitalization at another hospital. Admission chest film revealed

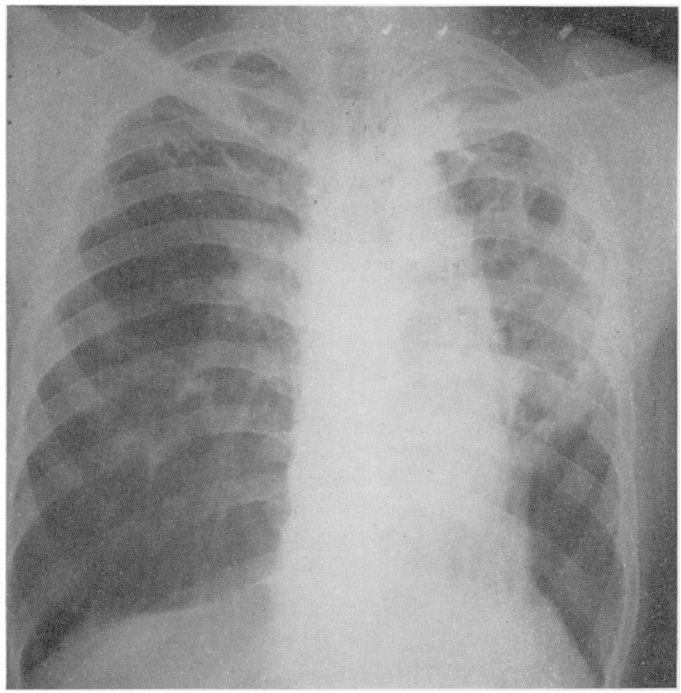

FIGURE 1. N. P.—Extensive infiltration and cavitation in left upper and lower lobes.

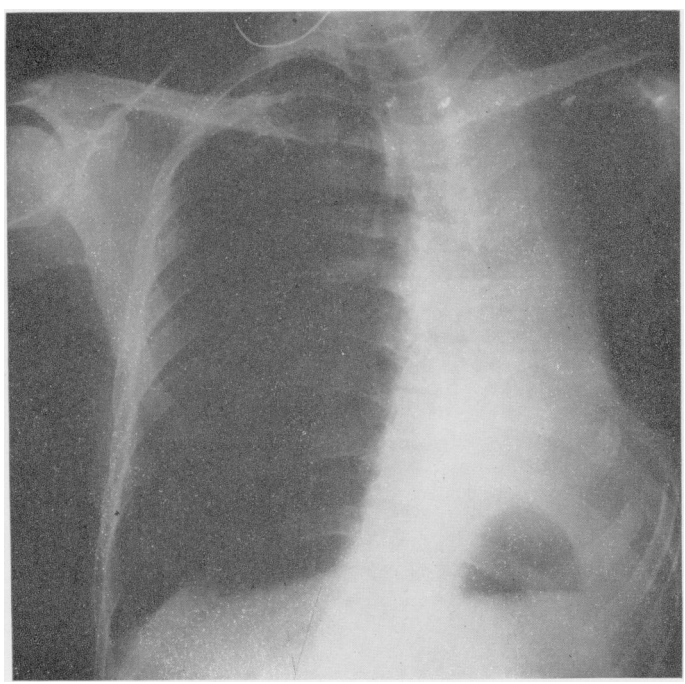

FIGURE 2. N. P.—Postoperative combined pneumonectomy and thoracoplasty.

extensive infiltration and multiple large cavities on the left, and infiltration in the right upper lobe. Left pneumonectomy was considered but operation was deferred because tomography revealed a questionable small cavity in the right upper lobe. Repeat tomography 2 months after admission failed to demonstrate cavity in this region, and patient was prepared for surgery. Bronchoscopy revealed no evidence of significant endobronchial tuberculosis.

Streptomycin 1 gm. daily was begun on July 5, 1948, and penicillin 50,000 units every 3 hours was started on July 13, 1948. After the usual preoperative preparation, left pneumonectomy and thoracoplasty were performed on July 14, 1948, in the manner described, generous posterior segments of ribs 2 through 7 being resected.

Convalescence was completely uneventful. Temperature remained normal from the ninth postoperative day, and the highest temperature recorded in the postoperative period was 100.4° F. Bathroom privileges were allowed on the third postoperative day.

The wound healed per primam and excellent collapse of the left upper hemithorax was present. Postoperative films showed no mediastinal shift at any time and there was no evidence of contralateral spread.

The patient, in excellent general condition, was transferred back to the referring facility on September 7, 1948. Cough was minimal and productive of a small amount of mucoid sputum which was repeatedly negative for acid-fast bacilli by smear and concentrate.

Case 2: R. K., white male, age 21. Admitted May 12, 1948, from another facility where he had been hospitalized since May 1947. Admission film revealed extensive infiltration and cavitation on the left, and an essentially clear right lung. Bronchoscopy in January 1948, had shown moderately severe tuberculous involvement of the left stem bronchus. Streptomycin therapy in dosage of 1 gm. daily for 6 weeks produced marked subjective improvement but Roentgen findings persisted.

Tomography revealed cavitation in both the left upper and lower lobes—one cavity being present anteriorly in the lingular segment of the upper lobe. Total thoracoplasty was considered but resection seemed preferable. The combined procedure was recommended. It should be noted that this patient observed the postoperative course of case 1 closely, and then also requested the procedure himself.

Streptomycin ⅔ gm. daily started August 19, 1948, and penicillin 50,000 units every 3 hours on August 21, 1948. Left pneumonectomy and thoracoplasty performed September 1, 1948. As noted in the preliminary discussion only ribs 3 through 7 were resected in this patient. The intercoastal structures, however, were freed from the medial aspect of rib 2 and allowed to fall inward.

Postoperative management of this patient was exactly as previously described, and convalescence was completely uneventful. Temperature remained normal from the third postoperative day. Patient was up in a wheelchair on the second postoperative day and ambulant on the fourth postoperative day. In regard to walking, it must be mentioned that this patient had had a traumatic mid-thigh amputation of the left leg at the age of 6, and ambulation necessitated his wearing a rather cumbersome prosthesis.

As a result of leaving in rib 2 as well as rib 1, this patient's posture and arm and shoulder function were excellent.

Cough and expectoration were non-existent after operation. Postoperative films showed a clear right lung and at no time any mediastinal displacement.

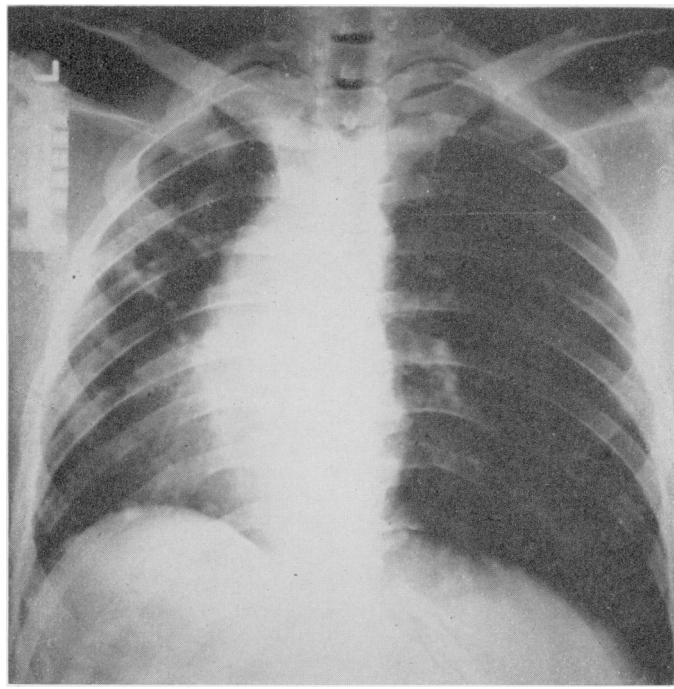

FIGURE 3. R. K.—Multiple cavities on left (film reversed).

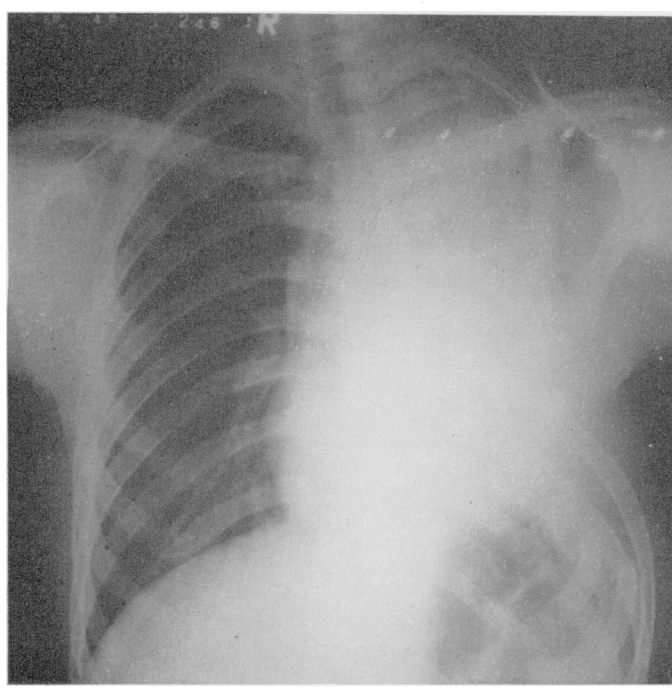

FIGURE 4. R. K.—Postoperative combined pneumonectomy and thoracoplasty. Note that both ribs 1 and 2 are intact.

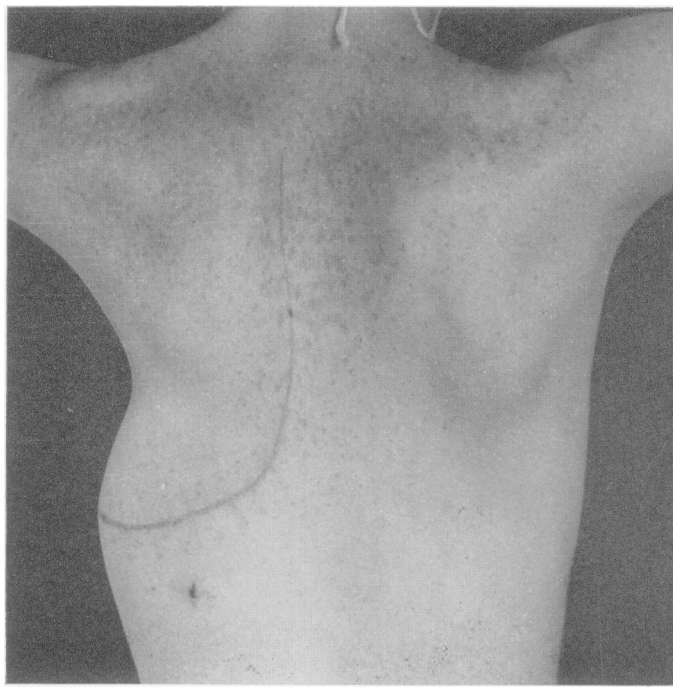

FIGURE 5. R. K.—Postoperative appearance showing minimal deformity.

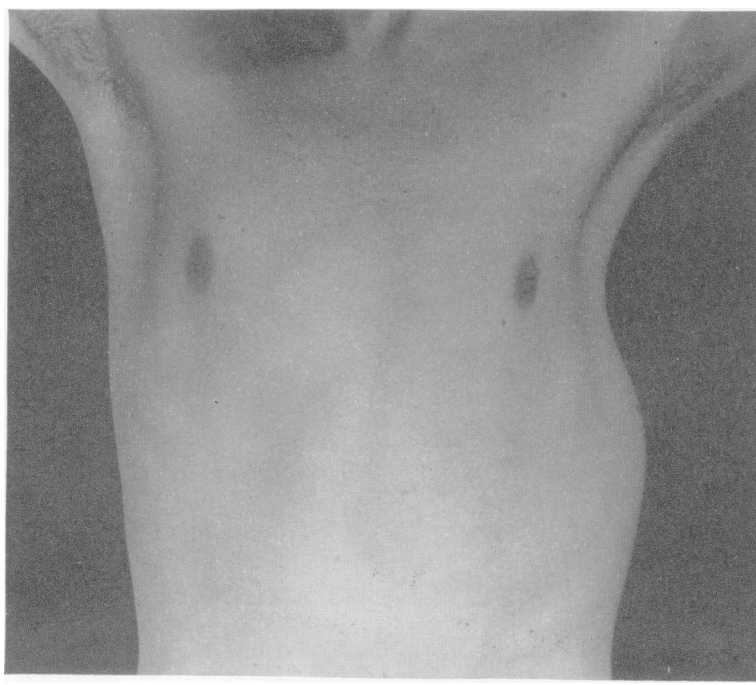

FIGURE 6. R. K.—Postoperative view.

Case 3: F. A., white male, 51 years of age. Admitted August 3, 1948, with chief complaints of severe cough productive of 12–16 oz. of bloody sputum daily for 3 weeks. Weight loss of 15 pounds.

History of treatment in a Brooklyn hospital in 1942, for a right lower lobe abscess. Apparently completely recovered after 5 months hospitalization, although chest films also revealed the presence of a large right upper lobe cyst.

Previous admission here in October 1946, when chest films revealed a huge right lower lobe abscess, and a large right upper lobe cyst. Pneumonectomy was considered, but seemed too hazardous in view of the patient's poor general condition, copious expectoration, and contralateral emphysema. Wide open drainage was therefore instituted in November 1946. Residual broncho-pleural fistulae were closed by a pedicled muscle flap in March 1947. Patient returned to full-time work as a crane operator in May 1947, and remained well until 3 weeks before the present admission.

Chest film on the present admission revealed several small lower lobe abscess cavities, and the right upper lobe cyst which showed no apparent change from previous films. The right lung was contracted and the left lung moderately emphysematous.

Patient placed on penicillin by both intramuscular and aersol routes with marked improvement in his condition—particularly in reduction of sputum output. He was prepared for surgery and on September 8, 1948, right pneumonectomy and thoracoplasty were performed. Despite the long and tedious dissection necessary to remove a lung completely "frozen" to the chest wall, the patient tolerated pneumonectomy extremely well. Thoracoplasty was then performed. Because of the patient's barrel-type chest, generous posterior segments of ribs 2 through 8 were resected to produce satisfactory collapse.

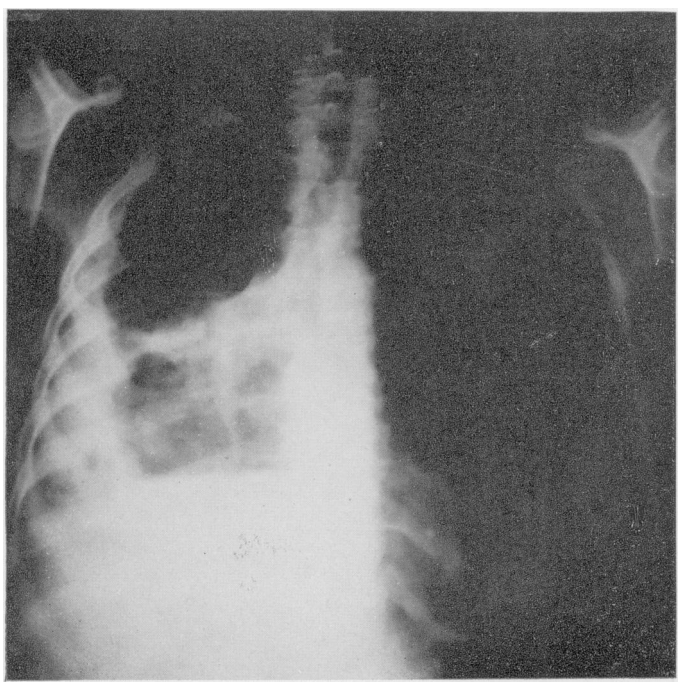

FIGURE 7. F. A.—Upper lobe cyst and huge right lower lobe abscess, October 1946.

FIGURE 8. F. A.—Lateral view of cyst and abscess, October 1946.

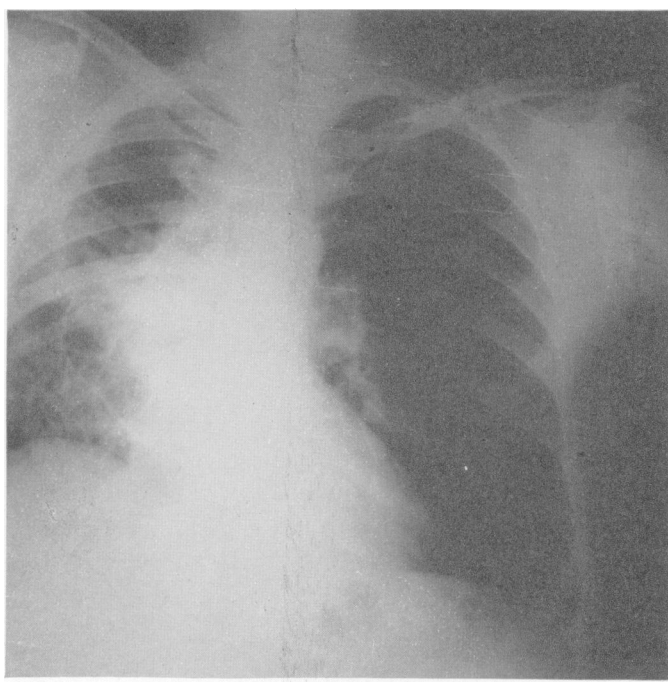

FIGURE 9. F. A.—Large right upper lobe cyst. Recurrence of right lower lobe abscess, August 1948.

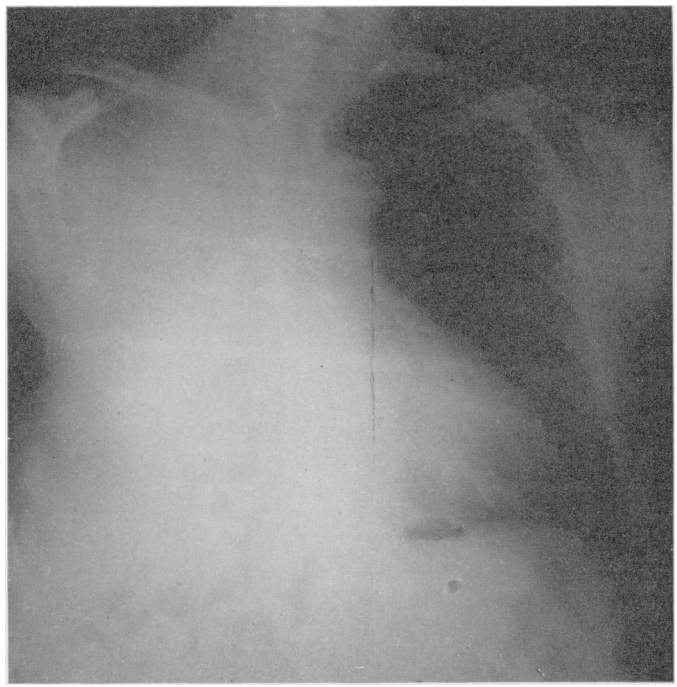

FIGURE 10. F. A.—Postoperative combined pneumonectomy and thoracoplasty.

Convalescence was uneventful. Temperature reached a high of 101.4° F. on the second postoperative day, and returned to normal on the fourth day. Patient was ambulant on the third postoperative day. The wound healed per primam. Cough and expectoration were negligible. Only complaints were moderate pain and stiffness in the right shoulder which are responding to physiotherapy.

Summary

The cases of three patients who have undergone total pneumonectomy and extensive thoracoplasty at a single operation have been presented, together with a description of the operative procedure and pertinent details of pre- and postoperative management. An unusually benign postoperative course was noted in all the patients.

It appears that this combined procedure presents several advantages:

1. The necessity for only one operation and shorter hospital stay are extremely desirable.
2. In the tuberculous patient, prompt obliteration of the pleural cavity should greatly lessen the dangers of bronchial fistula and empyema.
3. Mediastinal displacements with their disturbances in respiratory physiology, overdistention of remaining lung, etc., are avoided.

4. A more effective coughing mechanism appears to be present in the immediate postoperative period. This should lessen pulmonary complications.

We do not wish to convey the impression of advocating this combined procedure in every case presenting indications for both penumonectomy and post-pneumonectomy thoracoplasty. Decision will depend almost entirely on evaluation of the patient's condition upon completion of the peneumonectomy.

We wish to emphasize also that this is a preliminary report, and that we do not know what the late results will be. We have reason to believe they will be satisfactory. If there are any latent dangers in the procedure, they have not appeared up to the time of this report.

NOTE: Since submission of the above article for publication, the combined pneumonectomy and thoracoplasty has been performed in a single stage on four additional patients. Two of these patients had extensive pulmonary tuberculosis, one had bronchiogenic carcinoma, and one had both pulmonary tuberculosis and bronchiogenic carcinoma. The subsequent course of these patients has been equally satisfactory to those reported.

REFERENCES

(*1*) Overholt, R. H., Langer, L., Szypulski, J.: Pulmonary resection in the treatment of tuberculosis. J. Thoracic Surg. **15**:384–413 (1946).
(*2*) Brock, R. C.: A musculoplastic incision for posterior thoracoplasty. J. Thoracic Surg. **15**:182–185 (1946).

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 JANUARY 15, 1949*

Of the total of 4,086 cases of influenza reported (last week 4,136, 5-year median, 1944–48, 10,360), 3,434 occurred in 4 States, as follows (last week's figures in parentheses): Virginia 500 (347), South Carolina 502 (505), Arkansas 277 (175), Texas 2,155 (2,300). Only one other State, Arizona (129), reported currently more than 68 cases. The total for the first 2 weeks of the year is 8,222, as compared with 20,695 for the same weeks last year, which latter figure was also the 5-year median.

A total of 11,609 cases of measles was reported, last week 11,341, 5-year median 5,314. An aggregate increase of 1,482 cases occurred in the Middle Atlantic, North Central, South Atlantic, and Pacific areas, partly offset by a decrease of 1,214 in the New England, South Central, and Mountain areas. The largest numbers were reported in Texas, 1,585, Massachusetts, 1,435, New York, 1,005, and Virginia 645. The total for the first 2 weeks of the year is 22,950, as compared with 21,996, the largest comparable figure of the past 5 years (reported in 1944), and a 5-year median of 8,083.

Of 143 cases of poliomyelitis, the same number as reported last week (5-year median 40), California reported 62 (last week 57), Texas 9, Washington 7, and New Jersey 5. No other State reported more than 4 cases for the week. The total for the first 2 weeks of the year is 286, 5-year median 84.

New York reported 2 cases of anthrax during the week, and Alabama 1 case of Rocky Mountain spotted fever. A total of 53 cases of tularemia was reported, last week 37, 5-year median 32. The cumulative figure is 90 cases, 5-year median (reported last year), 64.

Deaths recorded during the current week in 92 large cities in the United States totaled 9,827, as compared with 10,723 last week, 10,131 and 9,952, respectively, for the corresponding weeks of 1948 and 1947, and a 5-year median of 10,136. For the first 2 weeks of the year the total is 20,550, same period last year, 21,420. Infant deaths totaled 712, last week 706, 5-year median 670, cumulative figure 1,418, corresponding weeks last year, 1,500.

* Information has been received that the case of suspected epidemic typhus fever in Tampa, Florida (PUBLIC HEALTH REPORTS January 28, p. 110) was definitely not epidemic typhus fever.

Telegraphic case reports from State health officers for week ended Jan. 15, 1949

[Leaders indicate that no cases were reported]

Division and State	Diphtheria	Encephalitis, infectious	Influenza	Measles	Meningitis, meningococcal	Pneumonia	Poliomyelitis	Rocky Mt. spotted fever	Scarlet fever	Smallpox	Tularemia	Typhoid and paratyphoid fever [d]	Whooping cough	Rabies in animals
NEW ENGLAND														
Maine				217		9			18				6	
New Hampshire	1		2	2		2			7					
Vermont				183			1		14				23	
Massachusetts	10			1,435	1	16			237				79	
Rhode Island				125		7			7				2	
Connecticut	1			127		61	1		41				9	
MIDDLE ATLANTIC														
New York	12		[b] 3	1,005	7	334	2		[c] 237			1	148	8
New Jersey	2		6	262	6	103	5		135				63	3
Pennsylvania	13		(b)	689	6		1		236			2	73	2
EAST NORTH CENTRAL														
Ohio	4		7	54	2	55			238				41	15
Indiana	8	1	18	130	1	19			49				14	13
Illinois	1		1	52	4	86	3		170		8	1	18	2
Michigan [a]	3			310	1	58	3		282				44	1
Wisconsin			8	426	5	4	3		65		2		61	
WEST NORTH CENTRAL														
Minnesota				16	1	8	4		63				2	
Iowa	1	2		7		4	3		34				9	1
Missouri	2		3	245	1	25	1		33		5		7	
North Dakota	1			20	1		1		11				1	
South Dakota				2			4		1					
Nebraska			3	10		4	1		20				7	
Kansas	1		6	313	1	17	1		30				3	
SOUTH ATLANTIC														
Delaware	3			10	1	2			4					
Maryland [a]	1		1	537	3	48			[c] 34		1		19	
District of Columbia				45		11			8				2	
Virginia	4		500	645	3	128	1		20		1		40	1
West Virginia	2		56	198	3	12	1		25			2	12	
North Carolina	9			202	3		1		37		5		36	
South Carolina	10		502	24	1	121	1		3		4	3	15	2
Georgia	6		9	71	1	13			23		7	1	2	9
Florida	6		12	70	2	32	4		5				6	2

EAST SOUTH CENTRAL														
Kentucky	5		3	98	7	40	1		55		2	2	21	1
Tennessee	4	1	49	77	6	79	1		37		7	1	25	
Alabama	9		53	219		58	4	1	13		1		5	10
Mississippi [a]	9		24	27	4	37			13		2		12	
WEST SOUTH CENTRAL														
Arkansas	13		277	142	1	61	2		6		1	2	9	6
Louisiana	6		34	4	1	35			5		3	7	1	
Oklahoma	2		68	79		23	3		6					5
Texas	18		2,155	1,585	7	400	9		32		3	2	110	26
MOUNTAIN														
Montana	2			22					19			1	2	
Idaho		1	6	35		1	2		[c] 15				2	
Wyoming		1	1	9		2			8					
Colorado	2		69	8	2	44	1		13				16	
New Mexico			2	56		18			3			1	13	
Arizona	1		129	50		24			4				13	
Utah [a]			6	143		17	4		5		1		4	
Nevada				4										
PACIFIC														
Washington	3		7	534	2	3	7		53				15	
Oregon	1		45	501	1	42	5		22				18	
California	6		21	584	6	50	62		80			3	54	6
Total	182	6	4,086	11,609	91	2,113	143	1	2,476		53	29	1,062	
Median, 1944–48	340	8	10,360	5,314	251		40	0	2,722	5	32	43	2,263	
Year to date 2 weeks	340	16	8,222	22,950	164		286	1	4,495	1	90	65	1,984	
Median, 1944–48	706	13	20,695	8,083	453		84	0	5,105	9	64	81	4,097	
	(27th)		(30th)	(35th)	(37th)		(11th)		(32d)	(35th)		(11th)	(39th)	
Seasonal low week ends	July 10		July 31	Sept. 4	Sept. 18		Mar. 20		Aug. 14	Sept. 4		Mar. 20	Oct. 2	
Since seasonal low week	5,454		44,492	75,343	1,008		27,613		27,193	16		3,184	12,017	
Median, 1943–48	8,272		64,253	34,207	1,957		13,448		43,676	85		4,332	29,546	

[a] Period ended earlier than Saturday.
[b] New York City and Philadelphia only, respectively.
[c] Including cases reported as streptococcal infection and septic sore throat.
[d] Including paratyphoid fever, reported separately, as follows: South Carolina 1; Louisiana 1; California 1; salmonella infections, not included, were reported as follows: Massachusetts 2; New York 1

Anthrax: New York 2 cases.
Alaska: Scarlet fever 3; streptococcal throat 2.
Territory of Hawaii: Influenza 3; measles 366; poliomyelitis 1.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended December 25, 1948.—During the week ended December 25, 1948, 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		24	1	255	517	44	159	63	139	1,202
Diphtheria				10	8	2	4			24
Dysentery:										
Amebic					1					1
Bacillary							3			3
Encephalitis, infectious							2			2
German measles				28	34		7	3	15	87
Influenza		1							3	4
Measles		31	3	164	56	89	33	80	124	580
Meningitis, meningococcal				2						2
Mumps		1	2	38	177	57	22	9	45	351
Poliomyelitis						1		1	2	4
Scarlet fever		2	3	145	33		2	12	2	199
Tuberculosis (all forms)		2	4	92	2	13	4	15	44	176
Typhoid and paratyphoid fever				3	1				2	6
Undulant fever		1			1					2
Venereal diseases:										
Gonorrhea		7	5	50	59	29	5	24	48	227
Syphilis		9	4	61	42	20	4	5	7	152
Whooping cough				97	5		2	4		108

MADAGASCAR

Notifiable diseases—November 1948.—Notifiable contagious diseases were reported in Madagascar and Comoro Islands during November 1948 as follows:

Disease	November 1948			
	Aliens		Natives	
	Cases	Deaths	Cases	Deaths
Beri-beri			48	0
Bilharziasis	1	0	133	0
Cerebrospinal meningitis			6	1
Diphtheria			2	0
Dysentery:				
Amebic	3	0	360	5
Bacillary	2	0	21	0
Erysipelas			22	1
Influenza	6	0	2,421	50
Leprosy			41	0
Malaria	303	4	32,913	250
Measles	4	0	119	0
Mumps	1	0	95	0
Plague			15	12
Pneumonia, broncho	1	0	200	47
Pneumonia, pneumococcic	2	2	397	85
Puerperal infection	1	0	2	0
Trachoma	1	0	2	0
Tuberculosis, pulmonary	4	1	86	11
Typhoid fever			11	0
Whooping cough	2	0	114	0

NETHERLANDS

Amsterdam—Psittacosis.—During the week ended December 18, 1948, 4 cases of psittacosis were reported in the city of Amsterdam, Netherlands.

INFLUENZA IN EUROPE

Information received January 8–14, 1949, states that widespread epidemics of a mild type of influenza have been indicated in reports from Italy, South Holland, and France. In Switzerland 13 cantons, principally Tessin and Geneva, were involved, also Bale City. Influenza is also stated to be prevalent in Vorarlberg in the Austrian Tyrol. Some cases were reported in certain towns in Turkey, but not in epidemic proportions. A few cases were reported in London, but no epidemic is evident in United Kingdom, Scandinavia, Spain, Hungary, Ireland, Poland, Portugal, or the American Zone of Germany.

In France about 20 percent of the population is stated to be affected. In half the cases investigated "A" type virus was identified. "A" type virus was also identified in South Holland.

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

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

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

Plague

India.—Information dated January 4, 1949, reports an outbreak of plague in the Bellighata district of Calcutta, India. On that date 2 cases were reported in that district, bringing to 5 the total number of cases reported during the outbreak. On the same date a report from Patna, Bihar State, stated that an outbreak of pneumonic plague had occurred in Gaya, where 18 deaths from that malady had been reported.

Indochina (French)—*Cambodia State—Pnompenh.*—During the week ended January 1, 1949, 2 cases of plague were reported in Pnompenh, Cambodia State, French Indochina.

Smallpox

Brazil.—During the period January 1–July 31, 1948, 430 cases of smallpox with 8 deaths were reported in Brazil. For the period July 1–31, 1948, 38 cases were reported in Rio de Janeiro.

China—Amoy.—During the recent outbreak in Amoy, China (see Public Health Reports for January 14, 1949, page 67, smallpox was reported October 17–December 20, 1948, as follows: October 17–20, 1 case; November 1–10, 5 cases; November 11–20, 25 cases, 2 deaths; November 21–30, 104 cases, 10 deaths; December 1–10, 106 cases, 7 deaths; December 11–20, 21 cases, 3 deaths.

Ecuador.—During the period January 1–October 15, 1948, 3,315 cases of smallpox (including alastrim) with 190 deaths were reported in Ecuador.

India.—Smallpox has been reported in cities in India as follows: Week ended December 18, 1948, Ahmedabad 36 cases; week ended January 1, 1949, Madras 14 cases, Bombay 7 cases, Cawnpore 2 cases.

Iraq.—For the week ended January 1, 1949, 50 cases of smallpox were reported in Iraq.

Syria.—Smallpox has been reported in Syria as follows: Week ended December 18, 1948, 76 cases, including 16 cases in Damascus, 15 cases in Homs, and 11 cases in Aleppo; week ended December 25, 86 cases.

Yellow Fever

Panama.—Information received on January 17, 1949, reports 8 cases of yellow fever with 6 deaths (2 confirmed) near the town of Pacora, which is approximately 25 miles from Panama City. Of the two deaths confirmed one was stated to have occurred in November 1948, and one in December.

DEATHS DURING WEEK ENDED JAN. 8, 1949

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

	Week ended Jan. 8, 1949	Corresponding week, 1948
Data for 94 large cities of the United States:		
Total deaths	10,790	11,377
Median for 3 prior years	11,377	
Deaths under 1 year of age	709	822
Median for 3 prior years	822	
Data from industrial insurance companies:		
Policies in force	70,647,007	66,844,594
Number of death claims	12,148	14,153
Death claims per 1,000 policies in force, annual rate	9.0	11.1

Examinations for Engineer Officers

Competitive examinations will be held April 11, 12, and 13, for appointment of engineer officers in the Regular Corps of the Public Health Service in the grades of junior assistant sanitary engineer (second lieutenant), assistant sanitary engineer (first lieutenant), and senior assistant sanitary engineer (captain).

Duty assignments include general sanitary engineering, water pollution control, industrial hygiene, malaria and typhus control, milk and food sanitation and environmental health research activities.

Entrance pay for the junior assistant grade with dependents is $3,391 a year; assistant grade with dependents, $3,811 a year; and senior assistant grade with dependents, $4,489 a year. Additional pay for service includes a 5 percent increase in base pay for every 3 years of service (time served in the past as an active or inactive member of the Armed Forces is credited). Promotions are made at regular intervals up to and including the grade of senior sanitary engineer which corresponds to the rank of lieutenant colonel, at $7,019 a year.

A junior assistant applicant must be a United States citizen at least 18 years old, and have a degree in one of the several branches of engineering from a school of recognized standing. (Undergraduate engineering students in the senior year may take the examination, but successful candidates will not be placed on active duty until graduation). An assistant applicant, in addition, must be at least 21 and have had at least 7 years of educational and professional training or experience subsequent to high school. At least 2 of the 7 years must be qualifying professional training or experience in public health or an acceptable related field. Additional qualifications for a senior assistant applicant are: 10 years of educational and professional training or experience subsequent to high school, at least 4 of the 10 years must be qualifying professional training, or employment in an official or nonofficial health agency or in an activity related to the field of public health.

The written professional examinations for the three grades will be based on the listed subjects as they relate to study courses generally provided in engineering schools of recognized standing for the junior assistant; to the professional training and experience requirements for the assistant grade; and to air hygiene, water, liquid and solid wastes, milk and food and vector control for the senior assistant grade.

(1) Basic science principles (including chemical, biological, physical and social sciences); (2) basic science application; (3) engineering practices; (4) public health methods and procedures; (5) specialty.

Application forms and additional information may be obtained from the Surgeon General, Public Health Service, Washington 25, D. C., Attention: Division of Commissioned Officers. Applications must be received before March 18. The written examination will require approximately 3 days and will be held at designated Public Health Service facilities at various cities throughout the United States. Transportation expenses to and from, and the cost of maintenance at the place of examination must be assumed by the applicant.

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