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## STUDIES OF THE ROLE OF FUNGI IN PULMONARY DISEASE

### I. CROSS REACTIONS OF HISTOPLASMIN[1]

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The development of techniques and facilities for mass X-ray of populations during the past 10 years has resulted in the demonstration of pulmonary lesions in many persons who have no obvious symptoms or history of illness. From a public health, medical, or the patient's viewpoint, the significance of these lesions depends upon their etiologies. In many of these cases clinical and laboratory examinations do not indicate a tuberculous etiology, and mycological examinations usually fail to demonstrate significant fungi. The laboratory methods of examination are unsatisfactory because in many cases the lesions revealed by mass X-ray survey are quiescent and therefore no satisfactory sputum or exudate is available. When direct methods of laboratory study are not applicable it is logical to utilize immunological procedures as aids in diagnosis.

The isolation of *Histoplasma capsulatum* from a hilar lymph node of a Tennessee child with pulmonary calcification led us to pursue further the possible role of histoplasmosis in "atypical pulmonary disease." However, no further isolations of *H. capsulaium* were made in a series of 35 cases with pulmonary calcification studied at autopsy.[2] A search for this fungus in sputum in "atypical pulmonary disease" in Tennessee, Alabama, and Ohio also failed to yield additional isolations (*10*). It was felt that before the possible role of histoplasmosis in pulmonary lesions could be thoroughly assessed a skin-testing antigen should be used. Accordingly histoplasmin was prepared and its potency and specificity have been tested in animals and in man, as reported herein.

[1] From the Division of Infectious Diseases, National Institute of Health, and St. Elizabeths Hospital.
[2] Study to be reported in a separate paper.

## PREPARATION OF ANTIGEN

Histoplasmin is a sterile broth filtrate of a culture of *H. capsulatum*. Van Pernis, Benson, and Holinger (*14*) prepared histoplasmin from dextrose broth cultures of the fungus. They observed an immediate reaction when the undiluted filtrate was injected intradermally in their patient and in experimentally infected mice. A delayed reaction was observed in dilutions up to 1:1,000. An acetone precipitate of the filtrate also elicited reactions. Zarafonetis and Lindberg (*15*) also reported the preparation and use of histoplasmin. This antigen has been prepared by a number of other investigators but the method of preparation has not been standardized.

The histoplasmin used in our investigations was prepared by growing strains of *H. capsulatum* on a synthetic broth medium made according to the formula recommended by Dr. C. E. Smith for the preparation of coccidioidin [3] (*13*).

| | |
|---|---|
| l-Asparagin | 14.00 gm. |
| Dipotassium phosphate c. p. ($K_2HPO_4$) | 1.31 gm. |
| Sodium citrate c. p. ($Na_3C_6H_5O_7$–$5\frac{1}{2}H_2O$) | 0.90 gm. |
| Magnesium sulphate (U. S. P.) ($MgSO_4$–7 $H_2O$) | 1.50 gm. |
| Ferric citrate (U. S. P.) VIII (Scales) | 0.30 gm. |
| Dextrose of the grade known as Cerelose (U. S. P. X.) | 10.00 gm. |
| Glycerine c. p. (U. S. P.) | 25.00 gm. |
| Water to make | 1,000.00 ml. |

This is similar to the medium used in making tuberculin. Experience has shown that this culture medium itself does not sensitize or elicit nonspecific reactions. The medium was dispensed in 3-liter Erlenmeyer flasks, 1,500 ml. per flask, and autoclaved. Bits of dry mycelium from agar slant cultures of *H. capsulatum* were floated on the surface of the broth, and the inoculated cultures were then incubated in a dark cupboard at room temperature for periods varying from 2 to 4 months (in one lot, 7 months). At the end of the incubation period the flask was shaken to immerse all the floating mycelium and on the following day the broth was filtered through a Berkefeld N filter and tested for sterility. Merthiolate was added to give a final concentration of 1:10,000, and the material was bottled without either concentration or restoration to original volume. The color of the filtrate was a clear amber.

The histoplasmin (H3) used most extensively in the investigations reported here, and used by Palmer in testing student nurses (*11*) was a filtrate of cultures 7 months old. Two strains of *H. capsulatum* were grown separately in the preparation of this lot and the filtrates pooled.[4] One was the strain already mentioned, which was isolated in this laboratory from a case with pulmonary calcification, and the second was the strain isolated by Van Pernis et al. (*14*), and kindly sent to us when requested immediately after their report was published

[3] Personal communication.

[4] The pooling of cultures is a customary procedure in the preparation of coccidioidin.

in 1941. This lot of histoplasmin was darker in color than other lots prepared, presumably because of the long period of incubation and the consequent concentration of culture ingredients and metabolic products. However, it was similar in antigenicity to all other lots prepared (see table 2). The other fungus antigens discussed in this paper were prepared from cultures incubated 80 to 100 days before filtration.

Several other fungus antigens were prepared in a manner similar to that described above, but only blastomycin, coccidioidin, and haplosporangin will be compared with histoplasmin in this report. Blastomycin was prepared from broth cultures of *Blastomyces dermatitidis*, coccidioidin from cultures of *Coccidioides immitis*, and haplosporangin from cultures of *Haplosporangium parvum*, a fungus causing pulmonary disease in wild rodents and immunologically related to *C. immitis*. Lots of filtrate were not pooled except in the case of lot No. 3 of histoplasmin.

## TOXICITY OF HISTOPLASMIN

One milliliter of undiluted histoplasmin was injected intraperitoneally into each of four guinea pigs and this dose was repeated 1 week later. Three guinea pigs were similarly tested with 0.5-ml. doses. No toxic reactions were observed.

Four young white mice (average weight 20 gm.) received injections of 0.5 ml. of undiluted histoplasmin in the tail vein and this dose was repeated 1 week later. Similar groups of mice received similar repeated injections of dilutions of 1:10 and 1:100 of histoplasmin. No toxic reactions were observed.

## HISTOPLASMIN SKIN REACTIONS IN GUINEA PIGS

Twelve normal white guinea pigs were tested by the intradermal injection of 0.1 ml. of each of three dilutions of histoplasmin, viz, 1:10, 1:100, and 1:1,000. No animals reacted to these dilutions. Repeated intradermal tests of four of these guinea pigs and of other control groups gave no indication that histoplasmin as used in intradermal testing is primarily irritating or sensitizes guinea pigs. Sixteen additional normal guinea pigs were skin tested with histoplasmin 1:100 before being experimentally inoculated with *Histoplasma*, and 24 normal guinea pigs were skin tested with histoplasmin and blastomycin (both 1:100) before being inoculated with *Blastomyces*. None of these normal animals reacted to the antigens used.

Guinea pigs were infected by the intraperitoneal injection of a pooled heavy suspension of ground mycelium and spores of *H. capsulatum*. Rabbits were similarly infected by either intravenous or intraperitoneal routes and were skin tested with histoplasmin 3 weeks later. Guinea pigs were skin tested with histoplasmin 2

weeks after inoculation and at intervals thereafter. Preliminary studies indicated that 0.1 ml. of a dilution of 1:100 of histoplasmin was a suitable test dose for animals, and this dose and dilution were regularly used unless otherwise indicated.

Infected animals, with few exceptions, gave definite and easily read skin reactions to histoplasmin. There was no immediate reaction. The reaction in the guinea pigs reached its height in about 24 hours and sometimes disappeared in 48 hours. In sensitized rabbits the reaction reached its height in 24 to 48 hours and persisted for as long as 6 days. Only reactions showing an area of edema 5 mm. or more in diameter were read as positive. In a few cases only erythema was observed and these were recorded as negative. In most animals which failed to react there was no edema or erythema. In positive reactions the area of erythema usually corresponds almost exactly to the area of edema.

Of 39 guinea pigs with experimental histoplasmosis, 32 reacted to a 1:100 dilution of histoplasmin (table 1). Of the 7 failing to react to this dilution, 5 gave a positive reaction to a 1:10 dilution. We did not determine the reason for the failure of the 2 remaining animals to become sensitized. All of the 9 rabbits with experimental histoplasmosis reacted to histoplasmin (table 2). The potency of histoplasmin in demonstrating skin sensitivity in experimentally infected animals was thus clearly demonstrated.

## CROSS REACTIONS WITH HISTOPLASMIN

Many investigators have observed the unreliability of fungus antigens when used as diagnostic agents in skin testing (*4*, *6*, *8*, *9*). One cannot accept the specificity of a fungus antigen until it has been tested against other mycoses. Guinea pigs with other experimental mycoses were therefore skin tested with histoplasmin. The mycoses in which cross reactions were observed are recorded in table 1. The mycoses in which cross reactions were not observed were eliminated because an adequate study has not been completed.

TABLE 1.—*Cross reactions in experimentally infected guinea pigs*

| Infected with— | Number of animals | Number reacting to 0.1 ml. of 1:100 dilution of— | | | |
|---|---|---|---|---|---|
| | | Histoplasmin | Blastomycin | Coccidioidin | Haplosporangin |
| *Histoplasma* | 39 | [1] 32 | 17 | 1 | 0 |
| *Blastomyces* | 8 | 8 | 7 | 1 | 0 |
| *Coccidioides* | 7 | 2 | 0 | 6 | 0 |
| *Haplosporangium* | 7 | 6 | 6 | 4 | 5 |

[1] 5 additional animals reacted to histoplasmin 1:10.

Of eight guinea pigs experimentally infected with *Blastomyces dermatitidis*, eight reacted to histoplasmin, seven to blastomycin,

and one to coccidioidin. Of seven experimentally infected with *Coccidioides immitis*, two reacted to histoplasmin, and six to coccidioidin. However, these animals were very ill when tested, and it is possible that additional animals would have reacted if a more chronic form of this mycosis had been induced. Of seven guinea pigs experimentally infected with *Haplosporangium parvum*, six reacted to histoplasmin, six to blastomycin, four to coccidioidin, and five to haplosporangin. Of nine rabbits with experimental histoplasmosis, nine reacted to histoplasmin and eight to blastomycin (table 2).

TABLE 2.—*Skin reactions to different lots of histoplasmin and to blastomycin in rabbits experimentally infected with* Histoplasma capsulatum

| Number of animals | Reacting to 0.1 ml. of 1:100 dilution of— | | | | | |
|---|---|---|---|---|---|---|
| | Histoplasmin lots | | | | | Blastomycin |
| | H3 | H4 | H5 | H6 | H7 | B4 |
| 9 | 9 | 9 | 9 | 9 | 8 | 8 |

The cross reaction with blastomycosis was particularly interesting, and an examination of the sensitizing ability of different strains of *B. dermatitidis* seemed indicated. Three sets of eight guinea pigs each were infected with strains of *B. dermatitidis* as indicated in table 3.

TABLE 3.—*Skin reactions in guinea pigs with experimental blastomycosis*

| Infecting strain | Number of animals | Reacting to histoplasmin 1:100 | | Reacting to blastomycin 1:100 |
|---|---|---|---|---|
| | | H3 | H4 | B4 |
| 6009 | 8 | 6 | 4 | 7 |
| 6011 | 8 | 7 | 6 | 8 |
| 6014 | 8 | 8 | 6 | 8 |

There appeared to be a slight difference in the sensitizing ability of the three strains of fungus used, but in view of the small numbers of animals tested and the inherent inaccuracies in skin testing, it is doubtful whether these differences would be apparent if the animals had been reinoculated, or if lower dilutions of the antigen had been used in testing.

### TITRATION OF HISTOPLASMIN AND BLASTOMYCIN

The obvious cross reaction between histoplasmin and blastomycin was further studied by a titration of the antigens (table 4). The 24 guinea pigs mentioned above were divided into 3 groups of 8, each group having been infected with a different strain of *B. dermatitidis*; 18 guinea pigs were experimentally infected with pooled cultures of

TABLE 4: PART 1.—*Titration of histoplasmin and blastomycin in guinea pigs with experimental histoplasmosis*

| Animal No. | Infecting strain *Histoplasma* | End point | | | |
|---|---|---|---|---|---|
| | | Histoplasmin No. 3 | | Blastomycin No. 4 | |
| | | Positive | Negative | Positive | Negative |
| 2635 | Pooled | 1:5,000 | 1:10,000 | 1:5,000 | 1:10,000 |
| 2565 | do | 1:5,000 | 1:10,000 | 1:1,000 | 1:5,000 |
| 2561 | do | 1:5,000 | 1:10,000 | 1:400 | 1:800 |
| 2631 | do | 1:5,000 | 1:10,000 | 1:200 | [1] 1:400± |
| 2630 | do | 1:5,000 | 1:10,000 | ---------- | ---------- |
| 2640 | do | 1:5,000 | 1:10,000± | 1:1,000 | 1:5,000± |
| 2563 | do | 1:1,600 | 1:5,000 | 1:800 | 1:1,000 |
| 2579 | do | 1:1,600 | 1:5,000 | 1:400 | 1:800 |
| 2629 | do | 1:1,600 | 1:5,000 | 1:200± | 1:400± |
| 2634 | do | 1:1,600 | 1:5,000 | 1:400 | 1:800 |
| 2638 | do | 1:1,000 | 1:5,000± | 1:1,000 | 1:5,000± |
| 2639 | do | 1:1,000 | 1:1,600± | 1:200 | 1:400 |
| 2580 | do | 1:1,000 | 1:1,600± | ---------- | 1:200 |
| 2632 | do | 1:1,000 | 1:1,600 | ---------- | 1:200 |
| 2578 | do | 1:800 | 1:1,000 | 1:400 | 1:800 |
| 2566 | do | 1:200 | 1:400 | ---------- | 1:200 |
| 2567 | do | ---------- | ---------- | ---------- | ---------- |
| 2636 | do | ---------- | ---------- | ---------- | ---------- |

[1] The designation ± indicates a reaction less than 5 mm. in diameter.

TABLE 4: PART 2.—*Titration of histoplasmin and blastomycin in guinea pigs with experimental blastomycosis*

| Animal No. | Infecting strain *Blastomyces* | End point | | | |
|---|---|---|---|---|---|
| | | Histoplasmin No. 3 | | Blastomycin No. 4 | |
| | | Positive | Negative | Positive | Negative |
| 2776 | 6014 | 1:10,000 | 1:20,000 | 1:5,000 | 1:10,000 |
| 2772 | 6011 | 1:1,600 | 1:5,000 | 1:1,600 | 1:5,000 |
| 2774 | 6014 | 1:1,600 | 1:5,000 | 1:1,600 | 1:5,000 |
| 2775 | 6014 | 1:1,600 | 1:5,000 | 1:1,600 | 1:5,000 |
| 2778 | 6014 | 1:1,600 | 1:5,000 | 1:1,600 | 1:5,000 |
| 2779 | 6014 | 1:1,600 | 1:5,000 | 1:1,600 | 1:5,000 |
| 2768 | 6011 | 1:1,600 | 1:5,000 | 1:1,600 | 1:5,000 |
| 2769 | 6011 | 1:1,600 | 1:5,000 | 1:1,600 | 1:5,000 |
| 2770 | 6011 | 1:1,600 | 1:5,000 | 1:1,600 | 1:5,000 |
| 2771 | 6011 | 1:1,600 | 1:5,000 | 1:1,600 | 1:5,000 |
| 2762 | 6009 | 1:1,600 | 1:5,000 | 1:200 | 1:400 |
| 2773 | 6014 | 1:1,000 | [1] 1:5,000± | 1:5,000 | 1:10,000 |
| 2758 | 6009 | 1:800 | 1:1,600± | 1:800 | 1:1,600± |
| 2761 | 6009 | 1:400 | 1:800 | 1:1,600 | 1:5,000 |
| 2777 | 6014 | 1:400 | 1:800± | 1:400 | 1:800 |
| 2763 | 6009 | 1:400 | 1:800 | 1:1,600 | 1:5,000 |
| 2764 | 6009 | 1:400 | 1:800± | 1:1,600 | 1:5,000 |
| 2766 | 6011 | 1:400 | 1:800± | 1:400 | 1:800 |
| 2760 | 6009 | 1:200 | 1:400 | 1:800 | 1:1,600± |
| 2767 | 6011 | 1:200 | 1:400 | 1:400 | 1:800± |
| 2757 | 6009 | ---------- | 1:200 | 1:1,600 | 1:5,000 |
| 2765 | 6011 | ---------- | 1:200 | ---------- | 1:200 |
| 2780 | 6014 | ---------- | 1:200 | ---------- | 1:200 |
| 2759 | 6009 | ---------- | 1:200± | ---------- | 1:200 |

[1] The designation ± indicates a reaction less than 5 mm. in diameter.

*H. capsulatum.* These animals were skin tested with histoplasmin and blastomycin diluted 1:200, 1:400, 1:800, 1:1,000, 1:1,600, 1:5,000, 1:10,000, and 1:20,000. Guinea pigs with experimental histoplasmosis reacted more consistently and usually to a higher dilution of histoplasmin than to blastomycin in this series. Guinea pigs with experimental blastomycosis reacted similarly to histoplasmin and blastomycin.

The fact that histoplasmin cross reacts so completely with blastomycin in experimental blastomycosis and to a lesser degree in experimental histoplasmosis may be due to a lower potency of the blastomycin or to an as yet unknown factor in the sensitization of the guinea pigs in these two diseases. There seems to be an almost complete cross reaction between histoplasmin and blastomycin in experimental blastomycosis and histoplasmosis in guinea pigs.

### HISTOPLASMIN AND BLASTOMYCIN TESTS IN PATIENTS

The authors have had under study in St. Elizabeths Hospital a group of 69 patients with atypical pulmonary lesions. After laboratory and clinical studies extending over a period of 3 years had failed to establish a tuberculous, mycotic, or other etiology, this group of patients and a comparable group of patients without pulmonary pathology were tested with histoplasmin, blastomycin, and coccidioidin. For this report, which is concerned with a comparison of antigens, both groups are tabulated together as the skin-testing results did not vary between the groups.[5] Except for seven patients (six Negroes and one Indian) all were white adults.

All individuals were initially tested with 0.1 cc. of a 1:1,000 dilution of each antigen intradermally. A reaction was considered positive if it had 5 x 5 mm. edema. As shown in table 5, 55 of 136 (40.4 percent) reacted to histoplasmin, 35 (25.7 percent) reacted to blastomycin, and 34 (25 percent) reacted to both antigens. The table also shows that the histoplasmin picked up 34 of 35 (97.1 percent) of those positive to blastomycin, while the blastomycin picked up 34 of 55 (61.8 percent) of those positive to histoplasmin.

TABLE 5.—*Cross reactions of histoplasmin and blastomycin in patients*

| | Blastomycin 1:1,000 | | Total |
|---|---|---|---|
| | Positive | Negative | |
| Histoplasmin 1:1000: | | | |
| Positive | 34 | 21 | 55 |
| Negative | 1 | 80 | 81 |
| Total | 35 | 101 | 136 |

In this series of cases, the incidence of positive reactions to histoplasmin and blastomycin was related to sex, being twice as high in males as in females (table 6). All of these patients were mentally ill and had been hospitalized for varying intervals. The age distribution given in table 5a shows that the majority were over 50 years

[5] The clinical, roentgenological, and laboratory studies on both the patients with atypical pulmonary lesions (infiltrations of the lung parenchyma of varying degrees) and the "normal" group will be reported in a separate paper.

TABLE 5a.—*Skin reaction to 0.1 cc. histoplasmin 1:1,000, blastomycin 1:1,000, and coccidioidin 1:1,000 in 136 patients by age groups*

| Age group | Sex | | | Histoplasmin | | | | Blastomycin | | | | Coccidioidin | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Positive | | Negative | | Positive | | Negative | | Positive | | Negative | |
| | Male | Female | Total | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| 20–29 | 0 | 2 | 2 | 0 | 0 | 2 | 100.0 | 0 | 0 | 2 | 100.0 | 0 | 0 | 2 | 100.0 |
| 30–39 | 4 | 1 | 5 | 0 | 0 | 5 | 100.0 | 0 | 0 | 5 | 100.0 | 0 | 0 | 5 | 100.0 |
| 40–49 | 13 | 5 | 18 | 6 | 33.3 | 12 | 66.7 | 4 | 22.2 | 14 | 77.8 | 1 | 5.6 | 17 | 94.4 |
| 50–59 | 25 | 11 | 36 | 18 | 50.0 | 18 | 50.0 | 10 | 27.8 | 26 | 72.2 | 0 | 0 | 36 | 100.0 |
| 60–69 | 28 | 14 | 42 | 15 | 35.7 | 27 | 64.3 | 11 | 26.2 | 31 | 73.8 | 1 | 2.4 | 41 | 97.6 |
| 70–79 | 15 | 15 | 30 | 14 | 46.7 | 16 | 53.3 | 10 | 33.3 | 20 | 66.6 | 3 | 10.0 | 27 | 90.0 |
| 80 and over | 3 | 0 | 3 | 2 | 66.7 | 1 | 33.3 | 0 | 0 | 3 | 100.0 | 0 | 0 | 3 | 100.0 |
| Total | 88 | 48 | 136 | 55 | 40.4 | 81 | 59.6 | 35 | 25.7 | 101 | 74.3 | [1] 5 | 3.7 | 131 | 96.3 |

[1] The 5 individuals positive to coccidioidin were also positive to both histoplasmin and blastomycin.

TABLE 6.—*Skin reaction to histoplasmin 1:1,000, blastomycin 1:1,000, and coccidioidin 1:1,000 according to sex*

| | Total number | Histoplasmin | | | | Blastomycin | | | | Coccidioidin | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Positive | | Negative | | Positive | | Negative | | Positive | | Negative | |
| | | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| Males | 88 | 43 | 48.9 | 45 | 51.1 | 29 | 32.9 | 59 | 67.1 | 4 | 4.5 | 84 | 95.5 |
| Females | 48 | 12 | 25.0 | 36 | 75.0 | 6 | 12.5 | 42 | 87.5 | 1 | 2.1 | 47 | 97.9 |
| Total number | 136 | 55 | 40.4 | 81 | 59.6 | 35 | 25.7 | 101 | 74.3 | 5 | 3.7 | 131 | 96.3 |

of age. However, it is interesting that not only was the incidence of positive histoplasmin and blastomycin reactions about the same in the different age groups studied, but two of the individuals tested who were over 80 years of age were positive to histoplasmin. One of these, when retested, was positive to blastomycin 1:100. The relationship of positive reactions to the time of residence in the hospital is given in table 7. The results suggest that the duration of residence in the hospital did not influence the incidence of positive reactions. This suggests the possibility that whatever the factor that induces this sensitization, once an individual becomes sensitized, this condition may in some instances persist for many years.

The results from skin tests with these antigens are dependent upon the potency of the antigen and the "degree of sensitization" of the individual tested. (The potencies of the antigens, histoplasmin and blastomycin, are roughly quantitated for guinea pigs in the titration given in table 4.) The "degree of sensitization" of the individuals tested with the antigens was not precisely determined. Over 80 percent of the reactions reported had an area of edema over 1 cm. in diameter. The largest reaction to histoplasmin in a 1:1,000 dilution

TABLE 7.—*Skin reaction to histoplasmin 1:1,000, blastomycin 1:1,000, and coccidioidin 1:1,000 in 136 patients according to years of residence in hospital*

| Years in hospital | Total number | Histoplasmin | | | | Blastomycin | | | | Coccidioidin | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Positive | | Negative | | Positive | | Negative | | Positive | | Negative | |
| | | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| 0-1 | 5 | 2 | 40.0 | 3 | 60.0 | 1 | 20.0 | 4 | 80.0 | 0 | 0 | 5 | 100.0 |
| 1-4 | 22 | 10 | 45.5 | 12 | 54.5 | 8 | 36.4 | 14 | 63.6 | 1 | 4.5 | 21 | 95.5 |
| 5-9 | 22 | 7 | 31.8 | 15 | 68.2 | 6 | 27.3 | 16 | 72.7 | 1 | 4.5 | 21 | 95.5 |
| 10-14 | 20 | 9 | 45.0 | 11 | 55.0 | 4 | 20.0 | 16 | 80.0 | 1 | 5.0 | 19 | 95.0 |
| 15-19 | 14 | 4 | 28.6 | 10 | 71.4 | 2 | 14.3 | 12 | 85.7 | 1 | 7.1 | 13 | 92.9 |
| 20-29 | 20 | 9 | 45.0 | 11 | 55.0 | 5 | 25.0 | 15 | 75.0 | 1 | 5.0 | 19 | 95.0 |
| 30-39 | 27 | 11 | 40.7 | 16 | 59.3 | 7 | 25.9 | 20 | 74.1 | 0 | 0 | 27 | 100.0 |
| 40-49 | 5 | 2 | 40.0 | 3 | 60.0 | 2 | 40.0 | 3 | 60.0 | 0 | 0 | 5 | 100.0 |
| 50-59 | 1 | 1 | 100.0 | 0 | 0 | 0 | 100.0 | 1 | 100.0 | 0 | 0 | 1 | 100.0 |
| Total | 136 | 55 | 40.4 | 81 | 59.6 | 35 | 25.7 | 101 | 74.3 | 5 | 3.7 | 131 | 96.3 |

was an area of edema 64 mm. in diameter; to a similar dose of blastomycin, 47 mm. in diameter. Twenty-one individuals with reactions to histoplasmin of from 10 to 23 mm. in diameter were retested with histoplasmin 1:10,000 dilution and only one was positive to this higher dilution. This patient gave a reaction only 7 mm. in diameter. Evidently the 1:1,000 test dose of this lot of antigen is near the upper threshold of sensitivity of the individuals retested.

The blastomycin used in this study was probably not as potent an antigen for humans as the histoplasmin. The 21 individuals retested with histoplasmin at 1:10,000 were negative to blastomycin at 1:1,000. All but 2 of these, however, were positive to blastomycin at 1:100 dilution.

Cross reactions between histoplasmin and blastomycin observed in animals were confirmed by the results of skin testing on patients. So far as these studies indicate, a positive histoplasmin reaction may be due to sensitization to either *H. capsulatum*, *B. dermatitidis*, or some other antigenic agent as yet undetermined.

## DISCUSSION

In any case of undiagnosed systemic disease, the possibility of a mycotic etiology should be considered. This problem of a differential diagnosis frequently arises in the case of pulmonary disease. The problem is accentuated by the current practice of roentgenological survey of populations which results in the demonstration of pulmonary lesions in many individuals not clinically ill. In many of these cases clinical and laboratory examinations do not indicate a tuberculous etiology and a search for significant fungi likewise is usually futile. Nevertheless, the suspicion remains that many of these lesions are mycotic in origin and attempts to establish diagnoses include procedures intended to demonstrate the presence of fungi.

In most cases of the sort under discussion there is no sputum or other pathological exudate which can be examined by microscope or culture, and it is natural to turn to immunological methods of diagnosis. These are notoriously unreliable in mycoses. Antibodies may be lacking, on the one hand, and cross reactions between different mycoses have been demonstrated repeatedly on the other. Immunological data therefore may be almost worthless in the diagnosis of a given case. Coccidioidin is the best known and most widely used of the fungus antigens, and its extensive use in skin testing has yielded epidemiological information of great interest and importance. Its limitations as a diagnostic agent are well known, however. Skin sensitivity to coccidioidin is retained for many years, and a positive skin reaction may indicate merely sensitization acquired during a mild or nonapparent infection during earlier residence within an endemic area. It may have no relationship to an infection in which a diagnosis is sought. Moreover, a small percentage of persons who have had no known exposure to *Coccidioides* react to coccidioidin. The significance of these aberrant reactions is not yet known. In the preparation of coccidioidin many lots have to be discarded because, when tested, they cause too many nonspecific reactions. Only certain lots, after critical test, are adjudged suitable for use. Histoplasmin and blastomycin share with coccidioidin the characteristics of possibly useful tools in epidemiological surveys. All have faults which seriously limit their usefulness as diagnostic materials.

X-ray studies of groups in the general population have shown striking geographical differences in the distribution of pulmonary calcification *(3)*. Pulmonary calcification is found frequently in tuberculin-negative individuals *(5, 7, 10)*. In an epidemiological study of these lesions in Ohio such a high incidence was found in individuals with no known exposure to tuberculosis that it was concluded they resulted from an unrecognized disease of very common occurrence *(10)*. Palmer *(11)* has recently reported that, in a group of student nurses studied, 91.5 percent of those with pulmonary calcification reacted to histoplasmin or tuberculin or both, and that of 2,141 who were negative to both tuberculin and histoplasmin only 1.2 percent had pulmonary calcification.

Aronson, Saylor, and Parr *(1)* found a correlation between pulmonary calcification and coccidioidin skin reactions within the endemic area of coccidioidomycosis, and Cox and Smith *(2)* demonstrated *Coccidioides* in calcified pulmonary nodules.

It is probable that our present concepts of histoplasmosis are incomplete. The disease, world-wide in distribution, is recognized as a generalized, almost invariably fatal disease *(12)*. Localized, nonsystemic lesions have been reported in only a few cases. We shall report later the case of a child with pulmonary calcification in which

histoplasmosis was apparently only a concomitant infection not important as a cause of the patient's death. The strain of *Histoplasma* isolated from a hilar lymph node of this child was used in the preparation of histoplasmin No. 3.

From the results obtained with blastomycin in this study it also is shown to be an antigen which produces a definite easily readable skin reaction. The reaction, however, is not specific, as shown by its cross reactions with histoplasmin and haplosporangin. It is possible that when histoplasmosis and blastomycosis are more fully known, both will prove to have benign, self-limited forms corresponding to the Valley fever (primary) type of coccidioidomycosis.

## SUMMARY AND CONCLUSIONS

1. Histoplasmin, blastomycin, coccidioidin, and haplosporangin were prepared by procedures similar to those used in making coccidioidin. Cross reactions between the four antigens were demonstrated.

2. A dilution of 1:100 of histoplasmin gave a positive reaction in guinea pigs with experimental histoplasmosis, blastomycosis, coccidioidomycosis, and haplomycosis.

3. Thirty-four of one hundred and thirty-six hospitalized persons reacted to both histoplasmin and blastomycin.

4. The significance of the surprisingly high incidence of positive reactions to histoplasmin and blastomycin in man remains to be determined. We are not at present in a position to evaluate the clinical or epidemiological significance of these positive reactions as they occur singly or together, in view of the demonstrated cross reactions between these antigens.

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## HEALTH EDUCATION IN THE PUBLIC HEALTH PROGRAM[1]

By MAYHEW DERRYBERRY, *Chief, Field Activities in Health Education*

Health education is universally accepted as an essential part of the public health program. Descriptions of the control activities for such diseases as tuberculosis, venereal disease, malaria, the acute communicable diseases, cancer, and the degenerative diseases always list health education as one of the important and necessary parts of the program. Even persons engaged in inspection and law enforcement have more recently stated that health education is a necessary tool in assisting them to achieve their objectives.

Coupled with this universal agreement on the importance of health education, there is almost complete disagreement on what constitutes a good health education program. In one department, a series of news releases, radio broadcasts, and occasional talks to groups on invitation constitute the health education program. In another, health education activities are all centered on the school child with syllabi, pamphlets, posters, and essay contests, special campaigns, and similar activities. In a third, the program consists of the production and distribution of films, pamphlets, posters, radio transcriptions, and the use of special mobile visual units to take the message to the people. In the fourth, every member of the staff carries on health education in daily contacts, and no other type of planned educational program is undertaken. In still a fifth, the emphasis is on the solving of health problems by the people of the community utilizing the technical guidance which the health department can provide.

This wide variance in programs arises in part from the difference in objectives to be served by the health education activities. In the early days of public health the provision of facilities for purification of the water supply or the passage of legislation providing for the

[1] From the Division of Public Health Methods. Read before the Conference of State and Territorial Health Officers at their Annual Meeting in Washington, D. C. April 1945.

pasteurization of milk would prevent much illness regardless of the knowledge or behavior of the people. All the health education needed was that required to win the support of sufficient people in the community to assure the appropriation of the funds or the passage of the legislation.

Today, however, public health has developed to the point where it has become apparent that many diseases cannot be controlled without full citizen understanding and participation. The provision of X-ray and diagnostic facilities, sanatoria, and rehabilitation services will not reduce tuberculosis unless people know the value of an X-ray of the chest, have one taken periodically, and take the necessary treatment if a diagnosis of tuberculosis is made. The best tumor clinics in the world will not reduce the mortality from cancer unless citizens avail themselves of the diagnostic service they provide and take treatment as indicated. Thus, the principal objective of health education today is the stimulation of public action and individual participation in preventive health activities.

This over-all objective of citizen participation is much more difficult than enlisting support for the program of the health department. First of all, it is difficult because everyone, including the housewife, the laborer, the white collar worker, the domestic, and the unemployed, must become informed on how to protect his health and act on that knowledge. Secondly, it is difficult because few people are interested in their own health sufficiently to do anything about it—at least not until they get sick. Therefore, it requires an intensive educational program to achieve any degree of success.

Realizing some of the difficulties involved, the Public Health Service in cooperation with several States set out in 1941 to experiment in the methods of stimulating individuals to participate in the solution of individual and community problems. The program began by assigning persons trained in public health and education to work as regular members of local health departments. The tasks of these workers were those prescribed by the Committee on Professional Education of the American Public Health Association in its statement of the functions in health education:

To assist in planning and organizing a program of health education suitable to the area of assignment.

To aid the community in organizing itself to find and solve its health problems.

To assist in promoting, organizing, and guiding study programs in health for various groups in the community.

To contribute to the improvement of the quality of health education of the school child through work with teachers, supervisors, and administrators.

To conduct an informational service for the purpose of answering citizens' inquiries about health.

To prepare, select, assemble, and distribute health education materials as needed to meet the community needs.

To conduct a speaker's bureau, conferences, meetings, and radio programs.
To assist with the in-service training of public health personnel.
To provide for a continuing appraisal of the health education activities.

Some of you may say, "But these tasks are the functions of all members of the health department staff." It is true that these broad educational functions are part of the responsibility of the total staff, but what does adequate performance of these tasks require?

Let us look at the health educator as he or she undertakes to work on only two of these functions, namely, assisting the community in organizing itself to find and solve its health problems and to promote study programs among various groups. As a beginning, he must know what organizations already exist in the community, what they know, what they do, who directs them, and their interests. One health educator in a community of 60,000 found over 200 agencies and organizations in the community. It was her first task to learn something about them, how many people were members, what they had already done in health education, and if they were willing to expand their program. It was particularly important to ascertain what proportion of the population had membership in the various organizations and what proportion would be left out of any program that worked only through existing organizations.

To gain this information she interviewed over 300 people in about 2½ months' time. These included representatives of the medical and dental societies, and other professional community representatives such as school authorities, welfare leaders, agricultural workers, voluntary agency executives, and a host of lay leaders in both the rural and urban parts of the community.

In addition to finding out what agencies there were, their interests, and their activities, these preliminary interviews were made to learn what information as well as what misinformation existed in the community. What did the people know about the health department and its program? Were they confused about its activities? For example, here are a few of the questions which citizens have asked during interviews by the health educator:

What does a health officer do except put up placards?
Why should I be interested in public health? It is only for the poor people. It is not important to me.
Does a public health nurse have to be as well trained as our hospital nurses?

(Most of these interviews were conducted in areas served by above-average health departments.) These are attitudes the health educator must know before a program is begun. He must be prepared to interpret the work of the health department in a very elementary fashion in such situations.

Oftentimes the people in the community feel that there are no health problems. The president of the Parent-Teachers Association

in one community of 60,000 stated that she had read about the great reduction in the tuberculosis death rate and was sure there was no need to do anything about tuberculosis in her community. Actually, there had been an average of 100 deaths per year during the past 5 years and 83 new cases had been discovered within the year.

A home demonstration agent in a county of 75,000 seriously reported when interviewed that there was no further need for venereal disease education in that community for it had been covered by a 5-minute presentation to all of the 700 members of her clubs during the past year.

Certainly such misconceptions and lack of understanding must be removed before constructive health education can take place.

Without such intimate knowledge, the health education lecture, film, news release, or pamphlet may miss the mark and accomplish no good whatsoever.

Interviewing to uncover the necessary information is time consuming and demands skillful handling. It requires more intensive work than the health officers, nurses, or sanitarians can spare from their own professional tasks. Yet this preliminary step has great potentialities for building and extending public relations in all directions. It involves a real sense of timing, an ability to get along with all classes of people, and an awareness of the fact that people when properly approached can be stimulated and guided to assume an active part in various public health programs. If, however, the interviews are not skillfully conducted, people will not be stimulated to work on the problems of the community. Instead, they may become antagonistic and oppose any activity, particularly if they feel a set program is being forced upon them.

Out of these interviews grows actual planning at the level of development within the community. Study group meetings are held and people learn of problems on which they plan to do something. No more does the health officer receive such generalized invitations as, "Would you come out to the East Side Garden Club and speak on some health subject which you think would interest our members?" Instead, the invitation is specific. "Can you come out and discuss with us how we can get more well-baby clinics in the eastern section of town?" or "What can be done about getting sanatorium care for the tuberculosis cases which have been found in this community?"

The preliminary interviews not only result in more meaningful invitations, they also greatly increase the number of groups that ask for information. In one community where only 32 meetings had been held during the 3 years prior to the arrival of a health educator, the number mounted to 400 during the first year and a half of her work in that area. In attendance at many of the meetings to provide the technical information the people wanted were the health officer, the

nurse, or the sanitary engineer, depending on the problem under consideration. Thus, the educational work by the other members of the staff became more effective and reached a larger number of people because of the preliminary arrangements and planning done by the health educator.

In order to serve all the groups that want information from the health department, the staff must be willing to meet with groups at the time they want to meet. This will mean meetings at night as well as during the regular working day. In one or two health departments we have found health officers who felt that night work by the health educators was unnecessary. They objected to the irregular schedule of the health educators. Certainly the objection could have arisen only from a misunderstanding of health education.

As groups in the community become informed about the problems, they undertake to sponsor various health department activities such as: Well-child conferences, maternity classes, early diagnosis drives for tuberculosis, rat campaigns, and food-handler classes. Thus, the health department finds itself being asked to do the things it was set up to do and has been wanting to get under way. The people feel responsible for the success of the activity instead of blaming the health department for not being more efficient.

From the above discussion it should be fairly clear that health education should be a generalized, continuing function. The effectiveness of the health educator is greatly restricted when his work is limited to one subject, such as tuberculosis, venereal disease, cancer, or dentistry. Furthermore, if there is a special health educator for each specific public health activity, the several programs compete with one another for public attention and this competition seriously detracts from the effectiveness of any one of them.

Turning to another function, such as school health education, we find the health educator equally active in learning about the present program in the school. Do the teachers understand and maintain a healthful environment for the children? Are the window shades adjusted properly? Is the heat well regulated? Are toilet rooms kept clean and supplied with water, soap, and towels? (In one school a health educator found that the boys' toilet was locked and had been for 4 months because of a burst pipe.)

What is being done to find the children who need medical attention? Are the teachers sensitized to behavior symptoms which they should recognize and bring to the attention of a physician? Is anything done about children who are found needing attention?

Is the health instruction devoted to the study of health problems of the school and community, or are the health periods devoted entirely to physical education or lessons in anatomy?

After learning the program in the school, the health educator works

with the school staff on real problems. Once the group is concerned about some problem, the health instruction period is no longer a period of entertainment where someone from the health department brings in a film and shows it. Instead, the children seek answers to problems and the movie showing becomes a method of obtaining the necessary information.

Learning how to solve health problems is no different from learning arithmetic or geography. No educator would show a film on the process of addition or put up a poster showing the boundaries of a State and expect the students to learn addition or geography from such passive experiences. Instead, these techniques might be used to stimulate interest or provide information, but learning the information in a way that will influence behavior requires more intensive participation on the part of the learner.

It is the health educator's task to be resourceful in working with the teachers, to assist them in setting up problem-solving situations for the children, to provide informational material in the form of references, pamphlets, visual aids, and technical personnel who can answer questions raised by children; to arrange observational tours and work experience in health agencies. In short, she guides the teacher to the proper technical sources for information and assists her in evaluating materials, when the advice from various sources differs.

To go into similar detail on all the functions ascribed to health education earlier in this paper is impossible. It should be obvious, however, from the description of the activities of a health educator concerned with only two of the functions mentioned that the amount of work requires full-time personnel in every health department of the size prescribed by the Committee on Local Health Units of the American Public Health Association.

It should also be obvious that successful accomplishment of the many and varied tasks a health educator is asked to perform requires a well-trained individual. Certainly interviewing leaders in the community and stimulating their interest in a public health program should not be entrusted to an individual who is not thoroughly grounded in the basic public health sciences and the technique of interviewing as well. Likewise, work with the schools requires an intimate knowledge of education to assure success.

The number of individuals who are trained in public health and education is extremely small. Therefore, if effective programs are to be carried on in other areas, personnel must be trained.

As a beginning towards meeting the need for trained personnel, a grant of $40,000 from the W. K. Kellogg Foundation was obtained in January 1943, and 24 individuals (17 on fellowships from the W. K. Kellogg Foundation and the remainder on stipend from the States) began training in March. An additional grant of $32,000 was obtained

in June 1943 for the academic year 1943–44. The National Foundation for Infantile Paralysis made available $50,000 in 1944, and an additional $60,000 for the academic year 1945–46. These fellowships are to provide a reservoir of trained individuals from which future employees of the Public Health Service and private agencies may be recruited. The funds cannot be used to pay stipends for personnel now employed by State and local health departments. Grant-in-aid funds may be used at the discretion of the State health departments to provide training for such individuals.

The type of training which health educators should receive has been defined by the Committee on Professional Education. It includes basic preparation in the health sciences, education, and the social sciences. It is our belief they should have such basic public health courses as epidemiology, vital statistics, bacteriology, public health administration, environmental sanitation, school and community health education, and, in addition, courses in adult education, public relations, and sociology.

The functions of the health educator working in the local health department have been discussed in considerable detail because the employment of such individuals is a new development in a program of rapidly growing importance. This emphasis on the local program is not intended to detract from the importance of a strong Division of Health Education in the State health department. If, however, it is agreed that each local department shall have the services of a well-trained health educator, then the functions of the Division in the State department become analogous to the functions of other divisions at the State level. They are:

1. Planning, developing, and administering a State-wide program in public health education.

2. Encouraging and promoting the development of programs in local health departments, utilizing trained personnel who are capable of working in all phases of the public health program and are also sufficiently competent in education to work with the schools.

3. Recruiting personnel and arranging for their training and assignment.

4. Assisting the medical, nursing, and sanitation personnel in their educational work by providing them with an educational mechanism and advice on effective techniques of education in various local situations.

5. Consulting with local health departments and local health educators on all matters pertaining to health education.

6. Maintaining relations with the press and the public, preparing articles and approving special stories and speeches by department personnel.

7. Preparing or securing public health education material and distributing it through useful channels.

8. Correlating the educational endeavors of the other divisions or bureaus in the State health department.

9. Coordinating the activities of all agencies in the State interested in health education.

10. Developing and maintaining a continuing in-service program of training for public health personnel.

11. Evaluating continually the materials and methods being used both in the State and in the local departments.

To carry out this variety of tasks in the State health department, personnel with specialized training will be required. The production of materials—news releases, exhibits, and other visual aids—requires skills that are seldom found in an individual competent to direct the entire program. Larger departments can utilize a higher degree of specialization in their personnel than is possible for the smaller departments.

Since the Health Education Division and the local health educators will assist in all the special programs, such as venereal disease control, maternal and child health, tuberculosis control, and all other phases of the program, the financing of the program should be made from a pooling of grant-in-aid and State funds. If proper cooperative relationships can be established, voluntary agencies may also contribute to support of the over-all program. In several States, tuberculosis associations, parent-teacher groups, junior leagues, crippled children's societies, and other similar groups, participate in financial support.

It cannot be emphasized too strongly that successful health education programs require close working together of departments of health and education. The need for such coordination has been recognized by the Federal health and education agencies and a very satisfactory arrangement has been developed. The health educator on the Office of Education staff serves as consultant in health education to the Public Health Service, and the health educator on the Public Health Service staff holds an appointment as consultant in health education on the Office of Education staff. Through this mechanism we are able to coordinate our efforts in every way. Several States have recognized the need for such cooperation between departments of health and departments of education and have met it through a variety of administrative set-ups. It is hoped that out of these various working arrangements will evolve ways in which both departments can make their maximum contribution to the health of the people.

## SUMMARY

Health authorities are becoming increasingly aware that many diseases are uncontrollable without the active participation of the people themselves. Stimulating public action and individual participation requires well-planned and coordinated programs of health education.

Demonstrations by several States and by the Public Health Service during the past 4 years have shown that people may be motivated to solve their own problems and to utilize the technical guidance of

their health department when there is on the staff of the local health department an individual skilled in community organization and also grounded in the fundamental sciences of public health, health education, and public relations.

Personnel so trained are unavailable at the present time. Health officers contemplating the initiation or expansion of their health education programs should be prepared to recruit and train personnel to man the program.

The Public Health Service stands ready on request to assist States in appraising their health education needs and in the development of comprehensive State plans based on the problems and resources within the State. It is also willing to make available to States the benefit of its experience in the recruitment of personnel for training.

The importance of health education in helping to realize fully practically all public health objectives has never been questioned. Only its methods have been criticized. Now that the elements of an effective program have been demonstrated, we can make progress as rapidly as funds and trained personnel become available.

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## DEATHS DURING WEEK ENDED OCTOBER 27, 1945

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

| | Week ended Oct. 27, 1945 | Corresponding week, 1944 |
|---|---|---|
| Data for 93 large cities of the United States: | | |
| Total deaths | 8,814 | 9,004 |
| Average for 3 prior years | 8,878 | |
| Total deaths, first 43 weeks of year | 384,867 | 386,224 |
| Deaths under 1 year of age | 586 | 629 |
| Average for 3 prior years | 669 | |
| Deaths under 1 year of age, first 43 weeks of year | 26,098 | 26,669 |
| Data from industrial insurance companies: | | |
| Policies in force | 67,290,775 | 66,836,251 |
| Number of death claims | 12,128 | 13,211 |
| Death claims per 1,000 policies in force, annual rate | 9.4 | 10.3 |
| Death claims per 1,000 policies, first 43 weeks of year, annual rate | 10.1 | 10.0 |

# PREVALENCE OF DISEASE

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

## UNITED STATES

### REPORTS FROM STATES FOR WEEK ENDED NOVEMBER 3, 1945

**Summary**

The incidence of poliomyelitis continued to decline. A total of 390 cases was reported as compared with 489 last week, 451 for the corresponding week last year, and a 5-year (1940–44) median of 285. Of the 12 States reporting 10 or more cases each, increases occurred in only 2—Connecticut (from 8 to 11) and Missouri (14 to 21). The total for the year to date is 12,342, as compared with 17,888 for the corresponding period last year (which was about 93 percent of the total for the year) and a 5-year median of 8,713.

A total of 88 cases of meningococcus meningitis was reported, as compared with 95 last week, 73 for the next earlier week, and a 5-year median of 59. States reporting currently more than 5 cases each (last week's figures in parentheses) are as follows: New York 15 (11), Texas 8 (6), Illinois 7 (8) and California 7 (8). The total to date is 7,103, as compared with 14,628 and 15,573, respectively, for the epidemic years of 1944 and 1943, and a 5-year median of 2,970.

A total of 719 cases of diphtheria was reported (more than for the corresponding week of any of the past 5 years), as compared with 832 last week and 518 for the corresponding week last year. Eight States (Ohio, Michigan, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Tennessee) reported an aggregate of 357 cases as compared with 121 cases reported by the same States for the corresponding week last year. The total to date is 14,102, as compared with 10,775 for this period in 1944.

Of the other diseases listed in the tables following, the current figures for encephalitis, measles, scarlet fever, and whooping cough are above those for the corresponding week last year, and the cumulative figures for the dysenteries, leprosy, tularemia, whooping cough, and undulant fever, are in excess of those for the same period in 1944.

A total of 9,023 deaths was recorded for the week in 93 large cities of the United States, as compared with 8,814 last week, 8,969 for the corresponding week last year, and a 3-year (1942–44) average of 8,752. The total for the year to date is 393,890, as compared with 395,193 for the corresponding period last year.

*Telegraphic morbidity reports from State health officers for the week ended November 3, 1945, and comparison with corresponding week of 1944 and 5-year median*

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

| Division and State | Diphtheria | | | Influenza | | | Measles | | | Meningitis, meningococcus | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Week ended— | | Median 1940–44 | Week ended— | | Median 1940–44 | Week ended— | | Median 1940–44 | Week ended— | | Median 1940–44 |
| | Nov. 3, 1945 | Nov. 4, 1944 | | Nov. 3, 1945 | Nov. 4, 1944 | | Nov. 3, 1945 | Nov. 4, 1944 | | Nov. 3, 1945 | Nov. 4, 1944 | |
| **NEW ENGLAND** | | | | | | | | | | | | |
| Maine | 11 | 0 | 1 | ------ | 1 | 1 | 5 | 3 | 55 | 0 | 0 | 0 |
| New Hampshire | 0 | 0 | 0 | ------ | ------ | ------ | 0 | 0 | 0 | 0 | 0 | 0 |
| Vermont | 0 | 0 | 0 | ------ | ------ | ------ | 0 | 1 | 3 | 0 | 0 | 0 |
| Massachusetts | 2 | 5 | 2 | ------ | ------ | ------ | 225 | 54 | 157 | 1 | 8 | 4 |
| Rhode Island | 0 | 2 | 1 | 9 | 19 | ------ | 0 | 0 | 0 | 0 | 0 | 1 |
| Connecticut | 0 | 3 | 1 | ------ | 1 | 1 | 12 | 18 | 18 | 2 | 6 | 1 |
| **MIDDLE ATLANTIC** | | | | | | | | | | | | |
| New York | 16 | 9 | 11 | [1] 2 | [1] 5 | [1] 5 | 58 | 23 | 126 | 15 | 18 | 13 |
| New Jersey | 3 | 4 | 5 | 4 | ------ | 6 | 12 | 12 | 19 | 4 | 6 | 2 |
| Pennsylvania | 7 | 5 | 9 | ------ | 5 | 3 | 58 | 33 | 143 | 4 | 15 | 3 |
| **E. NORTH CENTRAL** | | | | | | | | | | | | |
| Ohio | 41 | 12 | 18 | 7 | 2 | 11 | 7 | 11 | 26 | 5 | 15 | 2 |
| Indiana | 8 | 4 | 8 | 12 | 2 | 12 | 6 | 3 | 9 | 2 | 2 | 2 |
| Illinois | 2 | 3 | 16 | 4 | 1 | 3 | 142 | 8 | 38 | 7 | 8 | 2 |
| Michigan [2] | 24 | 18 | 7 | ------ | 3 | 2 | 117 | 13 | 127 | 3 | 4 | 3 |
| Wisconsin | 0 | 9 | 4 | 34 | 7 | 12 | 14 | 11 | 110 | 3 | 6 | 1 |
| **W. NORTH CENTRAL** | | | | | | | | | | | | |
| Minnesota | 7 | 25 | 6 | ------ | 1 | ------ | 4 | 5 | 6 | 3 | 5 | 2 |
| Iowa | 9 | 17 | 8 | ------ | ------ | 1 | 5 | 1 | 21 | 1 | 2 | 0 |
| Missouri | 17 | 3 | 3 | 3 | ------ | ------ | 14 | 1 | 3 | 3 | 5 | 1 |
| North Dakota | 6 | 6 | 3 | ------ | ------ | ------ | 10 | 1 | 4 | 1 | 0 | 0 |
| South Dakota | 0 | 2 | 3 | ------ | ------ | ------ | 2 | 3 | 3 | 1 | 0 | 0 |
| Nebraska | 3 | 0 | 2 | 6 | ------ | ------ | 5 | 4 | 4 | 0 | 1 | 0 |
| Kansas | 2 | 2 | 4 | ------ | 2 | 2 | 8 | 5 | 5 | 0 | 0 | 0 |
| **SOUTH ATLANTIC** | | | | | | | | | | | | |
| Delaware | 1 | 0 | 0 | ------ | ------ | ------ | 0 | 1 | 1 | 1 | 0 | 0 |
| Maryland [2] | 33 | 2 | 5 | 1 | 1 | 2 | 6 | 1 | 14 | 2 | 5 | 5 |
| District of Columbia | 0 | 0 | 1 | ------ | ------ | ------ | 2 | 2 | 2 | 0 | 2 | 1 |
| Virginia | 29 | 15 | 22 | 211 | 80 | 80 | 11 | 5 | 20 | 1 | 1 | 1 |
| West Virginia | 15 | 6 | 8 | ------ | ------ | 2 | 0 | 3 | 7 | 0 | 1 | 1 |
| North Carolina | 123 | 27 | 49 | ------ | 15 | 4 | 17 | 6 | 6 | 3 | 3 | 2 |
| South Carolina | 23 | 10 | 20 | 488 | 357 | 293 | 18 | 3 | 3 | 0 | 0 | 1 |
| Georgia | 41 | 29 | 25 | 4 | 50 | 25 | 8 | 2 | 2 | 0 | 0 | 1 |
| Florida | 8 | 17 | 8 | 7 | 2 | 3 | 0 | 11 | 3 | 2 | 2 | 0 |
| **E. SOUTH CENTRAL** | | | | | | | | | | | | |
| Kentucky | 13 | 12 | 13 | 2 | ------ | 5 | 55 | 0 | 14 | 1 | 2 | 2 |
| Tennessee | 43 | 8 | 9 | 16 | 1 | 14 | 3 | 3 | 8 | 1 | 0 | 1 |
| Alabama | 33 | 35 | 23 | 32 | 27 | 28 | 3 | 1 | 5 | 1 | 3 | 3 |
| Mississippi [2] | 26 | 28 | 17 | ------ | ------ | ------ | ------ | ------ | ------ | 0 | 3 | 1 |
| **W. SOUTH CENTRAL** | | | | | | | | | | | | |
| Arkansas | 31 | 27 | 19 | 93 | 66 | 31 | 2 | 6 | 2 | 0 | 2 | 0 |
| Louisiana | 12 | 17 | 14 | 3 | ------ | 2 | 2 | 1 | 1 | 0 | 1 | 0 |
| Oklahoma | 13 | 20 | 15 | 44 | 57 | 31 | 25 | 9 | 5 | 0 | 1 | 0 |
| Texas | 65 | 63 | 63 | 1,535 | 785 | 638 | 51 | 29 | 29 | 8 | 7 | 4 |
| **MOUNTAIN** | | | | | | | | | | | | |
| Montana | 0 | 2 | 1 | 5 | 5 | 4 | 17 | 2 | 11 | 0 | 1 | 0 |
| Idaho | 0 | 3 | 0 | 7 | ------ | ------ | 56 | 3 | 3 | 0 | 0 | 0 |
| Wyoming | 0 | 2 | 0 | ------ | ------ | 4 | 2 | 3 | 4 | 0 | 0 | 0 |
| Colorado | 10 | 3 | 4 | 46 | 29 | 21 | 9 | 11 | 24 | 2 | 0 | 0 |
| New Mexico | 3 | 8 | 1 | ------ | 1 | ------ | 1 | 0 | 1 | 0 | 0 | 0 |
| Arizona | 1 | 4 | 4 | 94 | 60 | 68 | 3 | 0 | 8 | 1 | 1 | 0 |
| Utah [2] | 0 | 0 | 0 | ------ | ------ | 3 | 17 | 11 | 6 | 1 | 0 | 0 |
| Nevada | 0 | 0 | 0 | ------ | 2 | ------ | 0 | 2 | 2 | 0 | 0 | 0 |
| **PACIFIC** | | | | | | | | | | | | |
| Washington | 3 | 20 | 6 | ------ | ------ | ------ | 119 | 11 | 11 | 2 | 1 | 2 |
| Oregon | 3 | 9 | 1 | 5 | 5 | 17 | 10 | 42 | 22 | 0 | 1 | 1 |
| California | 32 | 22 | 22 | 9 | 20 | 22 | 222 | 191 | 53 | 7 | 9 | 2 |
| Total | 719 | 518 | 518 | 2,623 | 1,612 | 1,553 | 1,363 | 569 | 1,771 | 88 | 147 | 59 |
| 44 weeks | 14,102 | 10,775 | 12,408 | 85,595 | 349,179 | 175,897 | 110,156 | 596,558 | 554,188 | 7,103 | 14,628 | 2,970 |

[1] New York City only.

[2] Period ended earlier than Saturday.

*Telegraphic morbidity reports from State health officers for the week ended November 3, 1945, and comparison with corresponding week of 1944 and 5-year median.*—Con.

| Division and State | Poliomyelitis | | | Scarlet fever | | | Smallpox | | | Typhoid and paratyphoid fever [2] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Week ended— | | Median 1940–44 | Week ended— | | Median 1940–44 | Week ended— | | Median 1940–44 | Week ended— | | Median 1940–44 |
| | Nov. 3, 1945 | Nov. 4, 1944 | | Nov. 3, 1945 | Nov. 4, 1944 | | Nov. 3, 1945 | Nov. 4, 1944 | | Nov. 3, 1945 | Nov. 4, 1944 | |
| NEW ENGLAND | | | | | | | | | | | | |
| Maine | 4 | 2 | 0 | 30 | 21 | 12 | 0 | 0 | 0 | 2 | 0 | 0 |
| New Hampshire | 0 | 1 | 1 | 6 | 7 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vermont | 2 | 0 | 0 | 0 | 6 | 6 | 0 | 0 | 0 | 1 | 0 | 0 |
| Massachusetts | 20 | 8 | 7 | 87 | 107 | 140 | 0 | 0 | 0 | 3 | 2 | 2 |
| Rhode Island | 1 | 0 | 0 | 5 | 7 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Connecticut | 11 | 8 | 3 | 14 | 23 | 23 | 0 | 0 | 0 | 0 | 0 | 1 |
| MIDDLE ATLANTIC | | | | | | | | | | | | |
| New York | 41 | 145 | 16 | 178 | 185 | 181 | 0 | 0 | 0 | 6 | 8 | 8 |
| New Jersey | 13 | 17 | 4 | 40 | 43 | 62 | 0 | 0 | 0 | 1 | 2 | 2 |
| Pennsylvania | 13 | 34 | 8 | 121 | 161 | 161 | 0 | 0 | 0 | 6 | 3 | 7 |
| EAST NORTH CENTRAL | | | | | | | | | | | | |
| Ohio | 11 | 31 | 9 | 230 | 226 | 226 | 0 | 0 | 0 | 4 | 4 | 5 |
| Indiana | 8 | 5 | 2 | 82 | 62 | 43 | 0 | 0 | 1 | 1 | 1 | 1 |
| Illinois | 30 | 23 | 23 | 123 | 128 | 148 | 0 | 0 | 0 | 1 | 4 | 2 |
| Michigan [3] | 7 | 24 | 11 | 99 | 144 | 118 | 0 | 2 | 1 | 2 | 0 | 3 |
| Wisconsin | 43 | 7 | 7 | 74 | 78 | 121 | 0 | 1 | 0 | 1 | 0 | 1 |
| WEST NORTH CENTRAL | | | | | | | | | | | | |
| Minnesota | 8 | 12 | 7 | 27 | 46 | 57 | 0 | 0 | 0 | 1 | 0 | 0 |
| Iowa | 18 | 6 | 2 | 53 | 40 | 55 | 0 | 0 | 1 | 0 | 2 | 2 |
| Missouri | 21 | 13 | 2 | 49 | 31 | 46 | 0 | 0 | 0 | 3 | 3 | 3 |
| North Dakota | 0 | 0 | 0 | 9 | 9 | 10 | 1 | 0 | 0 | 0 | 0 | 0 |
| South Dakota | 1 | 0 | 1 | 9 | 19 | 19 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nebraska | 1 | 1 | 3 | 29 | 25 | 17 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kansas | 8 | 4 | 4 | 73 | 93 | 60 | 0 | 0 | 0 | 0 | 2 | 1 |
| SOUTH ATLANTIC | | | | | | | | | | | | |
| Delaware | 1 | 2 | 0 | 7 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Maryland [3] | 9 | 16 | 1 | 33 | 58 | 54 | 0 | 0 | 0 | 3 | 0 | 4 |
| District of Columbia | 4 | 0 | 0 | 19 | 20 | 12 | 0 | 0 | 0 | 3 | 1 | 0 |
| Virginia | 3 | 8 | 7 | 99 | 61 | 61 | 0 | 0 | 0 | 4 | 1 | 5 |
| West Virginia | 1 | 4 | 2 | 107 | 80 | 70 | 0 | 0 | 0 | 2 | 3 | 3 |
| North Carolina | 2 | 18 | 3 | 104 | 106 | 106 | 0 | 0 | 0 | 0 | 4 | 4 |
| South Carolina | 1 | 1 | 1 | 15 | 18 | 17 | 0 | 0 | 0 | 0 | 1 | 2 |
| Georgia | 3 | 3 | 0 | 32 | 37 | 37 | 0 | 0 | 0 | 7 | 0 | 7 |
| Florida | 4 | 4 | 1 | 9 | 8 | 7 | 0 | 0 | 0 | 1 | 1 | 2 |
| EAST SOUTH CENTRAL | | | | | | | | | | | | |
| Kentucky | 1 | 9 | 5 | 78 | 48 | 64 | 0 | 0 | 0 | 5 | 5 | 5 |
| Tennessee | 11 | 2 | 0 | 83 | 23 | 59 | 0 | 0 | 0 | 6 | 2 | 1 |
| Alabama | 3 | 0 | 0 | 39 | 29 | 38 | 0 | 0 | 0 | 2 | 1 | 2 |
| Mississippi [3] | 5 | 2 | 0 | 20 | 20 | 14 | 0 | 0 | 0 | 2 | 2 | 2 |
| WEST SOUTH CENTRAL | | | | | | | | | | | | |
| Arkansas | 3 | 0 | 1 | 32 | 30 | 11 | 0 | 0 | 0 | 2 | 13 | 9 |
| Louisiana | 6 | 2 | 2 | 29 | 17 | 8 | 0 | 0 | 0 | 1 | 4 | 4 |
| Oklahoma | 3 | 0 | 1 | 28 | 21 | 21 | 0 | 0 | 0 | 3 | 3 | 7 |
| Texas | 8 | 8 | 8 | 149 | 95 | 38 | 0 | 0 | 0 | 11 | 13 | 9 |
| MOUNTAIN | | | | | | | | | | | | |
| Montana | 2 | 1 | 1 | 10 | 11 | 11 | 0 | 0 | 0 | 0 | 0 | 1 |
| Idaho | 4 | 0 | 0 | 14 | 40 | 14 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wyoming | 0 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| Colorado | 4 | 0 | 2 | 29 | 28 | 27 | 0 | 1 | 1 | 2 | 0 | 1 |
| New Mexico | 2 | 1 | 1 | 25 | 16 | 3 | 0 | 0 | 0 | 1 | 3 | 3 |
| Arizona | 1 | 0 | 0 | 6 | 7 | 2 | 0 | 0 | 0 | 1 | 1 | 1 |
| Utah [3] | 7 | 1 | 3 | 16 | 9 | 6 | 0 | 0 | 0 | 1 | 0 | 0 |
| Nevada | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| PACIFIC | | | | | | | | | | | | |
| Washington | 4 | 9 | 9 | 32 | 42 | 42 | 0 | 0 | 0 | 0 | 1 | 1 |
| Oregon | 1 | 2 | 2 | 26 | 20 | 12 | 0 | 0 | 0 | 2 | 0 | 1 |
| California | 36 | 17 | 9 | 221 | 163 | 134 | 0 | 0 | 0 | 3 | 5 | 3 |
| Total | 390 | 451 | 285 | 2,601 | 2,474 | 2,474 | 1 | 4 | 7 | 94 | 95 | 110 |
| 44 weeks | 12,342 | 17,888 | 8,713 | 151,246 | 162,990 | 116,334 | 302 | 340 | 689 | 4,365 | 4,881 | 6,111 |

[2] Period ended earlier than Saturday.

[3] Including paratyphoid fever reported separately, as follows: Massachusetts 2; Michigan 1; Georgia 1; Texas 1; Utah 1; Oregon 1; California 2.

*Telegraphic morbidity reports from State health officers for the week ended November 3, 1945, and comparison with corresponding week of 1944 and 5-year median*—Con.

| Division and State | Whooping cough | | | Week ended Nov. 3, 1945 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Week ended— | | Median 1940–44 | Dysentery | | | Encephalitis, infectious | Rocky Mt. spotted fever | Tularemia | Typhus fever, undulant | Undulant fever |
| | Nov. 3, 1945 | Nov. 4, 1944 | | Amebic | Bacillary | Unspecified | | | | | |
| **NEW ENGLAND** | | | | | | | | | | | |
| Maine | 23 | 17 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| New Hampshire | 8 | 0 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 |
| Vermont | 24 | 47 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Massachusetts | 188 | 95 | 168 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 4 |
| Rhode Island | 17 | 35 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Connecticut | 65 | 76 | 80 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 3 |
| **MIDDLE ATLANTIC** | | | | | | | | | | | |
| New York | 274 | 168 | 405 | 6 | 19 | 0 | 1 | 0 | 0 | 1 | 6 |
| New Jersey | 145 | 77 | 129 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pennsylvania | 199 | 104 | 199 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| **EAST NORTH CENTRAL** | | | | | | | | | | | |
| Ohio | 159 | 138 | 138 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 |
| Indiana | 31 | 1 | 19 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| Illinois | 92 | 50 | 161 | 1 | 1 | 0 | 3 | 0 | 0 | 0 | 4 |
| Michigan [2] | 91 | 49 | 155 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 5 |
| Wisconsin | 63 | 73 | 174 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| **WEST NORTH CENTRAL** | | | | | | | | | | | |
| Minnesota | 22 | 42 | 53 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 |
| Iowa | 4 | 3 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Missouri | 10 | 19 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| North Dakota | 0 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| South Dakota | 3 | 6 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Nebraska | 0 | 12 | 12 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Kansas | 16 | 21 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 |
| **SOUTH ATLANTIC** | | | | | | | | | | | |
| Delaware | 1 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Maryland [2] | 40 | 64 | 64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| District of Columbia | 7 | 6 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Virginia | 21 | 20 | 61 | 1 | 0 | 64 | 0 | 4 | 0 | 1 | 0 |
| West Virginia | 13 | 14 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| North Carolina | 53 | 57 | 103 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 1 |
| South Carolina | 31 | 59 | 51 | 1 | 11 | 0 | 0 | 0 | 0 | 3 | 0 |
| Georgia | 15 | 6 | 11 | 0 | 2 | 1 | 0 | 0 | 1 | 46 | 3 |
| Florida | 3 | 28 | 18 | 6 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| **EAST SOUTH CENTRAL** | | | | | | | | | | | |
| Kentucky | 21 | 15 | 63 | 0 | 0 | 6 | 0 | 1 | 1 | 0 | 2 |
| Tennessee | 38 | 11 | 20 | 0 | 0 | 2 | 0 | 0 | 0 | 4 | 1 |
| Alabama | 8 | 15 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 |
| Mississippi [2] | --- | --- | --- | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 |
| **WEST SOUTH CENTRAL** | | | | | | | | | | | |
| Arkansas | 14 | 32 | 30 | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Louisiana | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 3 |
| Oklahoma | 10 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Texas | 98 | 134 | 86 | 14 | 247 | 22 | 0 | 0 | 1 | 49 | 10 |
| **MOUNTAIN** | | | | | | | | | | | |
| Montana | 0 | 44 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Idaho | 20 | 5 | 6 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wyoming | 0 | 2 | 8 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Colorado | 31 | 2 | 31 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| New Mexico | 15 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Arizona | 5 | 3 | 3 | 1 | 0 | 16 | 0 | 0 | 0 | 0 | 0 |
| Utah [2] | 10 | 12 | 12 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| Nevada | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **PACIFIC** | | | | | | | | | | | |
| Washington | 20 | 15 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Oregon | 6 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| California | 135 | 94 | 185 | 2 | 2 | 0 | 7 | 0 | 0 | 3 | 8 |
| Total | 2,055 | 1,694 | 2,804 | 45 | 334 | 113 | 12 | 5 | 6 | 130 | 88 |
| Same week, 1944 | 1,694 | --- | --- | 60 | 790 | 124 | 6 | 3 | 7 | 134 | 69 |
| Average, 1942–44 | 2,292 | --- | --- | 35 | 417 | 88 | 10 | [4] 3 | 10 | [4] 100 | --- |
| 44 weeks: 1945 | 106,727 | --- | --- | 1,663 | 21,979 | 9,660 | 564 | 456 | 632 | 4,285 | 4,058 |
| 1944 | 81,128 | --- | --- | 1,584 | 20,540 | 7,761 | 570 | 447 | 478 | 4,426 | 3,402 |
| Average, 1942–44 | 130,955 | --- | [4]152,531 | 1,480 | 15,262 | 6,847 | 556 | [4] 447 | 644 | [4] 3,114 | --- |

[2] Period ended earlier than Saturday.

[4] 5-year median, 1940–44.

## WEEKLY REPORTS FROM CITIES

*City reports for week ended October 27, 1945*

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

| | Diphtheria cases | Encephalitis, infectious, cases | Influenza | | Measles cases | Meningitis, meningococcus, cases | Pneumonia deaths | Poliomyelitis cases | Scarlet fever cases | Smallpox cases | Typhoid and paratyphoid fever cases | Whooping cough cases |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cases | Deaths | | | | | | | | |
| **NEW ENGLAND** | | | | | | | | | | | | |
| Massachusetts: | | | | | | | | | | | | |
| Boston | 0 | 0 | ------ | 0 | 4 | 2 | 10 | 17 | 20 | 0 | 0 | 21 |
| Fall River | 0 | 0 | ------ | 0 | 0 | 0 | 2 | 0 | 7 | 0 | 0 | 0 |
| Springfield | 0 | 0 | ------ | 0 | 1 | 1 | 0 | 0 | 5 | 0 | 0 | 5 |
| Worcester | 1 | 0 | ------ | 0 | 30 | 0 | 6 | 0 | 8 | 0 | 0 | 1 |
| Rhode Island: | | | | | | | | | | | | |
| Providence | 0 | 0 | ------ | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 6 |
| Connecticut: | | | | | | | | | | | | |
| Hartford | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 2 | 3 | 0 | 0 | 1 |
| New Haven | 0 | 0 | ------ | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| **MIDDLE ATLANTIC** | | | | | | | | | | | | |
| New York: | | | | | | | | | | | | |
| Buffalo | 1 | 0 | ------ | 1 | 1 | 0 | 2 | 3 | 5 | 0 | 0 | 13 |
| New York | 12 | 0 | 4 | 0 | 24 | 5 | 54 | 17 | 62 | 0 | 7 | 83 |
| Rochester | 0 | 0 | ------ | 0 | 1 | 0 | 2 | 2 | 6 | 0 | 0 | 6 |
| Syracuse | 0 | 0 | ------ | 1 | 0 | 0 | 3 | 0 | 9 | 0 | 0 | 17 |
| New Jersey: | | | | | | | | | | | | |
| Camden | 1 | 0 | ---- | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 4 |
| Newark | 0 | 0 | 1 | 0 | 5 | 1 | 5 | 3 | 3 | 0 | 0 | 31 |
| Trenton | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 4 | 1 | 0 | 0 | 3 |
| Pennsylvania: | | | | | | | | | | | | |
| Philadelphia | 1 | 0 | 2 | 1 | 6 | 1 | 13 | 5 | 28 | 0 | 3 | 82 |
| Pittsburgh | 0 | 0 | ------ | 0 | 1 | 3 | 5 | 6 | 18 | 0 | 1 | 4 |
| Reading | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 7 |
| **EAST NORTH CENTRAL** | | | | | | | | | | | | |
| Ohio: | | | | | | | | | | | | |
| Cincinnati | 3 | 0 | ------ | 0 | 1 | 2 | 6 | 1 | 7 | 0 | 0 | 10 |
| Cleveland | 1 | 0 | 2 | 1 | 0 | 3 | 9 | 4 | 9 | 0 | 0 | 30 |
| Columbus | 2 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 11 | 0 | 0 | 3 |
| Indiana: | | | | | | | | | | | | |
| Fort Wayne | 0 | 0 | ------ | 0 | 1 | 0 | 3 | 0 | 1 | 0 | 0 | 0 |
| Indianapolis | 2 | 0 | ------ | 1 | 3 | 1 | 5 | 0 | 7 | 0 | 0 | 24 |
| South Bend | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Terre Haute | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Illinois: | | | | | | | | | | | | |
| Chicago | 1 | 0 | 1 | 0 | 91 | 4 | 27 | 8 | 35 | 0 | 1 | 50 |
| Springfield | 0 | 0 | ------ | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 |
| Michigan: | | | | | | | | | | | | |
| Detroit | 2 | 0 | ------ | 1 | 19 | 1 | 9 | 1 | 24 | 0 | 0 | 32 |
| Flint | 0 | 0 | ------ | 0 | 20 | 0 | 1 | 0 | 6 | 0 | 0 | 4 |
| Grand Rapids | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 5 | 0 | 0 | 2 |
| Wisconsin: | | | | | | | | | | | | |
| Kenosha | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| Milwaukee | 0 | 0 | ------ | 0 | 2 | 1 | 0 | 5 | 7 | 0 | 0 | 14 |
| Racine | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 4 |
| Superior | 0 | 0 | ------ | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| **WEST NORTH CENTRAL** | | | | | | | | | | | | |
| Minnesota: | | | | | | | | | | | | |
| Duluth | 1 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 5 | 0 | 0 | 1 |
| Minneapolis | 2 | 0 | ------ | 0 | 1 | 0 | 4 | 1 | 2 | 0 | 0 | 7 |
| St. Paul | 0 | 0 | ------ | 0 | 0 | 2 | 6 | 0 | 2 | 0 | 1 | 5 |
| Missouri: | | | | | | | | | | | | |
| Kansas City | 0 | 0 | ------ | 1 | 1 | 0 | 8 | 0 | 7 | 0 | 0 | 0 |
| St. Joseph | 0 | 0 | ------ | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| St. Louis | 0 | 0 | 1 | 0 | 0 | 4 | 9 | 18 | 11 | 0 | 2 | 4 |

See footnotes at end of table.

*City reports for week ended October 27, 1945*—Continued

| | Diphtheria cases | Encephalitis, infectious, cases | Influenza | | Measles cases | Meningitis, meningococcus, cases | Pneumonia deaths | Poliomyelitis cases | Scarlet fever cases | Smallpox cases | Typhoid and paratyphoid fever cases | Whooping cough cases |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cases | Deaths | | | | | | | | |
| **WEST NORTH CENTRAL—continued** | | | | | | | | | | | | |
| North Dakota: | | | | | | | | | | | | |
| Fargo | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| Nebraska: | | | | | | | | | | | | |
| Omaha | 0 | 0 | ------ | 0 | 0 | 0 | 3 | 2 | 4 | 0 | 0 | 0 |
| Kansas: | | | | | | | | | | | | |
| Topeka | 0 | 0 | ------ | 0 | 0 | 0 | 2 | 0 | 7 | 0 | 0 | 0 |
| Wichita | 0 | 0 | 1 | 0 | 1 | 1 | 4 | 0 | 8 | 0 | 0 | 2 |
| **SOUTH ATLANTIC** | | | | | | | | | | | | |
| Delaware: | | | | | | | | | | | | |
| Wilmington | 1 | 0 | ------ | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Maryland: | | | | | | | | | | | | |
| Baltimore | 11 | 0 | ------ | 0 | 2 | 0 | 8 | 0 | 12 | 0 | 0 | 39 |
| Cumberland | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Frederick | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| District of Columbia: | | | | | | | | | | | | |
| Washington | 0 | 0 | 1 | 1 | 3 | 1 | 8 | 3 | 13 | 0 | 3 | 11 |
| Virginia: | | | | | | | | | | | | |
| Richmond | 1 | 0 | 1 | 1 | 0 | 0 | 3 | 8 | 11 | 0 | 1 | 2 |
| Roanoke | 2 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| West Virginia: | | | | | | | | | | | | |
| Wheeling | 0 | 0 | ------ | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 |
| North Carolina: | | | | | | | | | | | | |
| Raleigh | 0 | 0 | ------ | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| Wilmington | 2 | 0 | ------ | 0 | 0 | 0 | 4 | 2 | 6 | 0 | 0 | 3 |
| Winston-Salem | 1 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 0 | 1 |
| South Carolina: | | | | | | | | | | | | |
| Charleston | 0 | 0 | 23 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Georgia: | | | | | | | | | | | | |
| Atlanta | 5 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 5 | 0 | 2 | 0 |
| Brunswick | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Savannah | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| Florida: | | | | | | | | | | | | |
| Tampa | 1 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| **EAST SOUTH CENTRAL** | | | | | | | | | | | | |
| Tennessee: | | | | | | | | | | | | |
| Memphis | 3 | 0 | 1 | 0 | 0 | 0 | 15 | 1 | 3 | 0 | 0 | |
| Nashville | 1 | 0 | ------ | 0 | 0 | 0 | 8 | 1 | 3 | 0 | 0 | 0 |
| Alabama: | | | | | | | | | | | | |
| Birmingham | 2 | 0 | 3 | 0 | 0 | 0 | 6 | 1 | 3 | 0 | 1 | 0 |
| Mobile | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| **WEST SOUTH CENTRAL** | | | | | | | | | | | | |
| Arkansas: | | | | | | | | | | | | |
| Little Rock | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Louisiana: | | | | | | | | | | | | |
| New Orleans | 0 | 0 | 2 | 1 | 0 | 0 | 6 | 6 | 7 | 0 | 2 | 1 |
| Shreveport | 4 | 0 | ------ | 0 | 0 | 0 | 6 | 1 | 1 | 0 | 0 | 0 |
| Texas: | | | | | | | | | | | | |
| Dallas | 5 | 0 | ------ | 0 | 2 | 1 | 6 | 0 | 10 | 0 | 0 | 1 |
| Galveston | 1 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| Houston | 2 | 0 | ------ | 0 | 0 | 0 | 5 | 2 | 11 | 0 | 0 | 0 |
| San Antonio | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 |
| **MOUNTAIN** | | | | | | | | | | | | |
| Montana: | | | | | | | | | | | | |
| Billings | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 0 |
| Great Falls | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| Helena | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Missoula | 0 | 0 | ------ | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Idaho: | | | | | | | | | | | | |
| Boise | 0 | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Colorado: | | | | | | | | | | | | |
| Denver | 2 | 1 | 2 | 1 | 2 | 1 | 8 | 0 | 4 | 0 | 0 | 8 |
| Pueblo | 0 | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 6 | 0 | 0 | 4 |
| Utah: | | | | | | | | | | | | |
| Salt Lake City | 0 | 0 | ------ | 0 | 5 | 0 | 1 | 4 | 3 | 0 | 0 | 4 |

*City reports for week ended October 27, 1945*—Continued

| | Diphtheria cases | Encephalitis, infectious, cases | Influenza | | Measles cases | Meningitis, meningococcus, cases | Pneumonia deaths | Poliomyelitis cases | Scarlet fever cases | Smallpox cases | Typhoid and paratyphoid fever cases | Whooping cough cases |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cases | Deaths | | | | | | | | |
| PACIFIC | | | | | | | | | | | | |
| Washington: | | | | | | | | | | | | |
| Seattle | 2 | 0 | ------ | 2 | 39 | 0 | 5 | 0 | 15 | 0 | 0 | 6 |
| Spokane | 0 | 0 | ------ | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 6 |
| Tacoma | 1 | 0 | ------ | 0 | 31 | 0 | 0 | 0 | 1 | 0 | 0 | 4 |
| California: | | | | | | | | | | | | |
| Los Angeles | 3 | 0 | 8 | 0 | 8 | 0 | 2 | 3 | 39 | 0 | 0 | 25 |
| Sacramento | 0 | 0 | ------ | 0 | 4 | 1 | 1 | 0 | 2 | 0 | 0 | 7 |
| San Francisco | 3 | 0 | ------ | 0 | 39 | 1 | 4 | 1 | 14 | 0 | 0 | 10 |
| Total | 85 | 1 | 59 | 14 | 362 | 37 | 332 | 136 | 530 | 1 | 28 | 619 |
| Corresponding week, 1944 | 105 | ------ | 43 | 23 | 205 | ------ | 333 | ------ | 589 | 0 | 24 | 468 |
| Average, 1940–44 | 85 | ------ | 64 | [1] 21 | [2] 361 | ------ | [1] 327 | ------ | 579 | 0 | 21 | 887 |

[1] 3-year average, 1942–44.
[2] 5-year median, 1940–44.

*Dysentery, amebic.*—Cases: Providence, 1; New York, 4; Philadelphia, 1; Cleveland, 1; Chicago, 1; Spokane, 4; Los Angeles, 1; San Francisco, 1.
*Dysentery, bacillary.*—Cases: Boston, 1; Providence, 3; Buffalo, 1; New York, 7; Philadelphia, 1; Detroit, 4; Charleston, S. C., 3; Atlanta, 1; Memphis, 1; Denver, 1; Los Angeles, 4.
*Dysentery, unspecified.*—Cases: Cincinnati, 10; Baltimore, 1; Richmond, 1; San Antonio, 3.
*Rocky Mountain spotted fever.*—Cases: Buffalo, 1.
*Tularemia.*—Cases: Chicago, 1.
*Typhus fever endemic.*—Cases: Atlanta, 16; Savannah, 3; Tampa, 2; Nashville, 1; Birmingham, 3; Shreveport, 1; Houston, 2; Los Angeles, 1.

*Rates (annual basis) per 100,000 population, by geographic groups, for the 84 cities in the preceding table (estimated population, 1943, 34,018,300)*

| | Diphtheria case rates | Encephalitis, infectious, case rates | Influenza | | Measles case rates | Meningitis, meningococcus, case rates | Pneumonia death rates | Poliomyelitis case rates | Scarlet fever case rates | Smallpox case rates | Typhoid and paratyphoid fever case rates | Whooping cough case rates |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case rates | Death rates | | | | | | | | |
| New England | 3.0 | 0.0 | 0.0 | 0.0 | 105 | 9.0 | 72.1 | 57.1 | 141 | 0.0 | 0.0 | 102 |
| Middle Atlantic | 6.9 | 0.0 | 3.7 | 1.4 | 18 | 4.6 | 40.7 | 18.5 | 62 | 0.0 | 5.1 | 116 |
| East North Central | 6.7 | 0.0 | 1.8 | 1.8 | 85 | 7.3 | 40.1 | 11.6 | 72 | 0.0 | 0.6 | 106 |
| West North Central | 6.0 | 0.0 | 4.0 | 2.0 | 8 | 13.9 | 75.6 | 41.8 | 94 | 2.0 | 8.0 | 38 |
| South Atlantic | 40.7 | 0.0 | 49.2 | 5.1 | 8 | 1.7 | 64.5 | 23.7 | 95 | 0.0 | 10.2 | 95 |
| East South Central | 35.4 | 0.0 | 23.6 | 0.0 | 0 | 0.0 | 171.2 | 17.7 | 65 | 0.0 | 5.9 | 53 |
| West South Central | 40.2 | 0.0 | 8.6 | 2.9 | 6 | 2.9 | 68.9 | 28.7 | 92 | 0.0 | 8.6 | 6 |
| Mountain | 15.9 | 7.9 | 15.9 | 7.9 | 135 | 7.9 | 87.4 | 47.7 | 111 | 0.0 | 15.9 | 127 |
| Pacific | 14.2 | 0.0 | 12.7 | 3.2 | 193 | 3.2 | 22.1 | 6.3 | 114 | 0.0 | 0.0 | 92 |
| Total | 13.1 | 0.2 | 9.1 | 2.2 | 56 | 5.7 | 51.0 | 20.9 | 81 | 0.2 | 4.3 | 95 |

# FOREIGN REPORTS

## CANADA

*Provinces—Communicable diseases—Week ended October 13, 1945.*—During the week ended October 13, 1945, 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 | | 4 | | 57 | 128 | 40 | 28 | 69 | 79 | 405 |
| Diphtheria | | 10 | 1 | 51 | 1 | 3 | | | 1 | 67 |
| Dysentery: | | | | | | | | | | |
| Amebic | | | | | 1 | | | | | 1 |
| Bacillary | | | | | | | | | 7 | 7 |
| German measles | | | | 5 | 17 | | 2 | 3 | 4 | 31 |
| Influenza | | 18 | | | 13 | | | | 7 | 38 |
| Measles | | 1 | 1 | 40 | 85 | 2 | 1 | 2 | 104 | 236 |
| Meningitis, meningococcus | | | | 1 | 5 | | | | 1 | 7 |
| Mumps | | 2 | | 18 | 42 | 12 | 1 | 22 | 17 | 114 |
| Poliomyelitis | | 4 | | 3 | [1] 13 | 1 | 4 | | | [1] 25 |
| Scarlet fever | | 8 | 17 | 110 | 60 | 20 | 9 | 22 | 16 | 262 |
| Tuberculosis (all forms) | | | 5 | 142 | 50 | 26 | 21 | 9 | 39 | 292 |
| Typhoid and paratyphoid fever | | | | 16 | 3 | 1 | | 1 | | 21 |
| Undulant fever | | | | 1 | 2 | | | | | 3 |
| Venereal diseases: | | | | | | | | | | |
| Gonorrhea | | 43 | 11 | 162 | 133 | 51 | 30 | 33 | 73 | 536 |
| Syphilis | | 7 | 7 | 92 | 79 | 16 | 9 | 4 | 35 | 249 |
| Whooping cough | | | 3 | 138 | 10 | 3 | 1 | 5 | 1 | 161 |

[1] Includes 7 cases, delayed reports.

## CUBA

*Habana—Communicable diseases—4 weeks ended October 13, 1945.*—During the 4 weeks ended October 13, 1945, certain communicable diseases were reported in Habana, Cuba, as follows:

| Disease | Cases | Deaths | Disease | Cases | Deaths |
|---|---|---|---|---|---|
| Diphtheria | 13 | 1 | Tuberculosis | 4 | 2 |
| Malaria | 1 | | Typhoid fever | 10 | |

*Provinces—Notifiable diseases—4 weeks ended October 6, 1945.*—During the 4 weeks ended October 6, 1945, cases of certain notifiable diseases were reported in the Provinces of Cuba, as follows:

| Disease | Pinar del Rio | Habana [1] | Matanzas | Santa Clara | Camaguey | Oriente | Total |
|---|---|---|---|---|---|---|---|
| Cancer | | 2 | 6 | 13 | | 18 | 39 |
| Diphtheria | 4 | 17 | 5 | | | 2 | 28 |
| Hookworm disease | | 15 | | | | | 15 |
| Leprosy | | 1 | 1 | 1 | | 10 | 13 |
| Malaria | 24 | 2 | 5 | 3 | 2 | 96 | 132 |
| Poliomyelitis | | | | | | 1 | 1 |
| Tuberculosis | 24 | 29 | 15 | 49 | 29 | 61 | 207 |
| Typhoid fever | 23 | 45 | 41 | 86 | 39 | 88 | 322 |
| Undulant fever | | | | 1 | | | 1 |
| Whooping cough | | | | 4 | | | 4 |

[1] Includes the city of Habana.

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

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. 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

*Italy—Taranto.*—Plague has been reported in Taranto, Italy, as follows: Week ended October 20, 1945, 1 case, 1 death; week ended October 27, 1 case.

*Peru—Piura Department—Province of Huancabamba.*—For the month of September 1945, 1 case of plague with 1 death was reported in the Province of Huancabamba, Piura Department, Peru.

*Tunisia.*—For the period September 21–30, 1945, 1 case of plague was reported in Tunisia.

### Smallpox

*Morocco (French).*—For the period October 11–20, 1945, 115 cases of smallpox were reported in French Morocco, distributed by regions as follows: Agadir and frontier districts, 45; Casablanca, 30; Fez, 16; Marrakech, 11; Meknes, 13.

### Typhus Fever

*Chile.*—For the period August 12 to September 8, 1945, 41 cases of typhus fever with 5 deaths were reported in Chile. Provinces reporting the highest incidence are as follows: Santiago, 17 cases, 4 deaths; Antofagasta, 7 cases; Concepcion, 6 cases.

*Colombia—Bogota.*—Information dated October 18, 1945, states that an outbreak of typhus fever has occurred in Bogota, Colombia, where 7 deaths have been reported during the past 2 weeks. It is stated that since the beginning of the year, 218 cases with 25 deaths have occurred.

*Morocco (French).*—For the period October 11–20, 1945, 155 cases of typhus fever were reported in French Morocco, including cases reported by regions as follows: Casablanca, 91; Fez, 1; Meknes, 56; Rabat, 7.

### Yellow Fever

*Venezuela—Merida State—Tovar District—Municipality of Mora—Quebradita.*—Telegraphic information dated October 24, 1945, states that 1 confirmed case of yellow fever has occurred in Quebradita, Municipality of Mora, Tovar District, Merida State, Venezuela.

# HEALTH SERVICE AREAS—REQUIREMENTS FOR GENERAL HOSPITALS AND HEALTH CENTERS [1]

### A Review

Increasingly in recent years, spokesmen for hospital organizations and public health agencies have emphasized the need for integration of programs and facilities over areas sufficiently broad to render practical the extension of modern services to all sections of the population. Advantages to be derived from coordinating such facilities and programs, both within local districts and throughout wide regions, have been discussed in general terms, but only in limited areas have means been tried to relate specific activities of one institution with those of another. Now, in most of the States, commissions are confronted with the task of evaluating health needs and facilities and of devising more comprehensive and unified programs. To persons engaged in such undertakings and to those interested in the outcome, a recent bulletin issued by the United States Public Health Service, entitled "Health Service Areas—Requirements for General Hospitals and Health Centers," should prove both suggestive and helpful.

The authors emphasize the importance of appraising existing resources and of identifying areas of deficiency before embarking on a program of expansion. Using published data on hospital facilities and trading areas, they have developed a Nation-wide pattern of health service areas, in which counties are grouped into districts and districts into region within State boundaries. The focal point of each local grouping is usually the city or town with the largest number of general and allied special hospital beds. Within each region, the district hospital center apparently having the greatest service potentialities is selected as the primary center while others are designated as secondary. This theoretical network reflects the expressed belief of the authors in the need for an organized system linking small hospitals and health centers wherever they may be with larger hospitals, and then, with teaching and research centers. Such an arrangement should provide opportunities for the continuing education of professional and technical workers, as well as channels to appropriate institutions for referring patients who need highly specialized services.

Health centers are visualized for every significant rural community and urban neighborhood. To their more traditional functions is added that of furthering the coordination and development of hospital and public health services. A well-conceived program to wipe out deficits in hospital and health center facilities, the authors state,

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[1] Health Service Areas—Requirements for General Hospitals and Health Centers. By Joseph W. Mountin, Elliott H. Pennell, and Vane M. Hoge. Public Health Bulletin No. 292. Government Printing Office, 1945. For sale by the Superintendent of Documents, Washington 25, D. C. Price 25 cents.

would involve a planned sequence of construction. For illustrative purposes, they suggest a tentative scheme of priority ratings.

The outlines of health service areas are regarded primarily as patterns for use in measuring the distribution of current facilities and in estimating additional needs on a local area basis. Maps and extensive tabular material augment the usefulness of the bulletin for reference purposes. The maps, which are drawn on a common scale for each of the 48 States, show county boundaries and outlines of suggested local districts and regions, as well as the names and locations of designated district and regional hospital centers.

A series of tables follows, in which may be found the names of counties making up the various districts and regions, together with county, district, regional, and State totals for selected items pertinent to an evaluation of general hospital and health center needs. Data on population, buying income, land area, beds in general and special hospitals, and physicians are given for each county and are, therefore, available for use by persons who may wish to consider districts of different composition than those illustrated. Percentages and ratios showing relationships among the various factors mentioned are supplied for each district, region, and State.

Estimates, based on widely accepted standards, of the minimum number of new general and allied special hospital beds needed are submitted for each of the suggested hospital service districts and regions. Health centers needed are estimated by type for different population groups in each State. An additional feature is the "selected bibliography" in which are listed published articles, statements, and reports, by hospital, medical, and public health authorities, concerning the need for greater integration of health facilities or plans for achieving this end.

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