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## NURSING ACCOMPLISHMENTS AS REVEALED BY CASE RECORDS[1]

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This paper represents an inquiry into the accomplishments of field nurses through data obtained from the records which they have kept on their cases. Such a study offers one approach to an evaluation of nursing achievements, since individual case records have been generally assumed to furnish an index to the work performed and the results attained.

Individual case records set forth the nurse's story of a patient's condition, a story sometimes complete in one issue but more often continued through several. In a series of repeated instructions and services, one naturally looks for an accompanying upward line of progress in pupil or patient, and the data used herein have been analyzed for evidence of change in the total conditions which the nurses went out to see and came back to record.

In the past, evaluations of nursing services have been based upon volume and intensity of service in relation to the needs of the community. Evidence of the more elusive quality of service, as expressed by the changing state of the patient, has been sought in the present analysis. This change may be expressed in better management of the environment, improvement in health habits, a step forward on the road to recovery, and other items of a similar character. These cannot be said to depend wholly on the ministrations of the nurse, since one must take into consideration the limitations imposed by insufficiency of medical, clinical, and other physical facilities, by the economic status of those among whom the nurses are working, and by the intelligence of the patients.

The usual individual case records carry a list of the items which the nurses are to investigate through observation or inquiry. These

[1] From the Division of Public Health Methods, National Institute of Health. This is the nineteenth in a series of papers presenting an analysis of the procedures followed in county health departments, and the ninth paper dealing with the nursing activities. Grateful acknowledgment is made to Miss Pearl McIver and Miss Helen Bean who supervised the collection of the data and assisted in the preliminary planning of the study. Particular recognition is due Miss Georgie Brockett who prepared all the tabular material.

items pertain to the condition of the patient and the health practices that he follows. To reduce the time spent on record keeping, codes are used to indicate whether an item is satisfactory, or the degree to which it is unsatisfactory. The code customarily used is 0 for satisfactory; 1, 2, and 3 for slightly, moderately, and decidedly unsatisfactory, in the order named; and X for a condition that should have medical attention. Not only does this code provide a rapid means of recording observations, but it also reduces discursive material to a numerical basis, thus rendering these observations more susceptible to analysis.

It would seem logical that, under such a system of record-keeping, the nurse's comments on a case to which she had made more than one visit would indicate what had been accomplished. For example, if the nurse records a 3, which means decidedly unsatisfactory, for diet, sleep, or elimination at the time of her first visit, and on a return call enters a 1, which means slightly unsatisfactory, it would be assumed that she considered the condition improved. But if she still records a 3, the inference would be that she regarded the condition as just about the same. If she gives a 3 to some item which she coded as 0 on the previous visit, it should indicate that in her opinion the condition had grown worse.

True, a possibility of error lurks in this use of case records to evaluate accomplishments in that a nurse may not be exact in her judgments or may not keep precise records. Nevertheless, the record forms and the codes were designed to reveal conditions observed by the nurse on an initial visit and the subsequent change that took place. For that reason a study patterned after the above logic is in keeping with the original purpose of the record. It should be kept in mind that the nurses' entries make up the data, and the situations revealed are no more accurate than their judgments of the conditions which they observed and recorded.

The records used in the present analysis represent the visits made by the field nurses of two county health departments over a period of one year.[2]

The volume of data distributed according to the type of service represented is given in table 1. Although the number of cases included for each service is relatively small, the total observations made

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[2] A complete description of the forms and the method of collecting the records of cases is given in the previous paper of this series entitled "Do Case Records Guide the Nursing Service?" (Pub. Health Rep., 54: 66-76 (1939)).

The characteristics of the counties and a description of the method of record-keeping followed by the nurses is given in four previous papers: Mountin, Joseph W.: Effectiveness and economy of county health department practice. Pub. Health Rep., 49: 1232-1241 (1934); Bean, Helen, and Hankla, Emily: Case records as an index of the public health nurse's work. Pub. Health Rep., 52: 1077-1088 (1937); Bean, Helen, and Brockett, Georgie S.: The family as a unit for nursing service. Pub. Health Rep., 52: 1923-1931 (1937); and Bean, Helen: Number and length of nursing visits as indices of nursing service. Pub. Health Rep., 53: 913-921 (1938).

by the nurses in each service are fairly large.[3] Since the study is concerned with the extent to which unsatisfactory items improved or satisfactory items became worse, the number and proportion of the items recorded as unsatisfactory on the first or second visit, or on both visits, are also given in the table. The number of unsatisfactory conditions is small in county B for school and adult health supervision, for postpartum and for communicable disease services, and in county C for postpartum and tuberculosis services. Even for these, the volume of data is sufficient to denote trends and to substantiate deductions made from the data in the other categories of service.

TABLE 1.—*Number of cases visited more than once for each type of service in the 2 counties and summary of items recorded as being unsatisfactory*

| Type of service | Number of cases visited more than once | Number of items | | | |
|---|---|---|---|---|---|
| | | Possible to observe on each case | Total possible observations | Unsatisfactory on first visit, second visit, or both | |
| | | | | Number | Percentage |
| **COUNTY B** | | | | | |
| Health supervision: | | | | | |
| Infant | 107 | 24 | 2,568 | 626 | 24.4 |
| Preschool | 69 | 24 | 1,656 | 523 | 31.6 |
| School and adult | 42 | 5 | [1] 192 | 50 | 26.0 |
| Maternity: | | | | | |
| Antepartum | 68 | 20 | 1,360 | 447 | 32.9 |
| Postpartum | 33 | 9 | 297 | 57 | 19.2 |
| Tuberculosis | 182 | 12 | [2] 2,177 | 251 | 11.5 |
| Communicable disease | 43 | 5 | [3] 179 | 35 | 19.6 |
| **COUNTY C** | | | | | |
| Health supervision: | | | | | |
| Infant | 187 | 24 | 4,488 | 766 | 17.1 |
| Preschool | 27 | 24 | 648 | 162 | 25.0 |
| School and adult | 210 | 5 | [1] 1,001 | 181 | 18.1 |
| Maternity: | | | | | |
| Antepartum | 67 | 20 | 1,340 | 443 | 33.1 |
| Postpartum | 49 | 9 | 441 | 75 | 17.0 |
| Tuberculosis | 32 | 12 | [3] 352 | 87 | 24.7 |
| Communicable disease | 2,435 | 5 | [3] 9,561 | 2,682 | 28.1 |

[1] Item "elimination" was omitted on early record forms.
[2] A small number of cases were reported on forms containing fewer items.
[3] Items "rest" and "elimination" were omitted on early record forms.

For the purposes of the tabular comparisons which constitute the basic analysis, the items were separated according to the factor of change between the first and second visits. The groups resulting from this division are as follows:

1. Items unsatisfactory on first visit but improved at time of second visit.
2. Items unsatisfactory on first visit; no improvement at time of second visit.

[3] Total number of observations is the number of items appearing on the case records multiplied by the number of cases.

3. Items unsatisfactory on first visit; nurse failed to observe and record condition at time of second visit.
4. Items unsatisfactory on first visit that became worse in interval between visits.
5. Items satisfactory on first visit but unsatisfactory on second visit.
6. Items satisfactory on both first and second visits.
7. Items left ungraded on both first and second visits.

The items in groups 1 to 4 are those on which the nurses would be expected to work for improvement and are, therefore, the most important to this analysis. Group 5 represents the negative changes that took place during the interval between two visits, and although on these items the nurses might not have worked specifically, the records show the conditions to be changed and for that reason data on this group are presented. Items in group 6 offer no evidence of change one way or the other and are of no value in studying accomplishments. It is possible that some of them changed for the better, but the records were not designed to reveal a condition of increasing satisfactoriness. Failure to record the satisfactory or unsatisfactory nature of certain conditions at the time of both the initial and subsequent visits makes it impossible to use the items in group 7 in measuring the nurses' achievements.

The items recorded as below par on the first visit are distributed in table 2 according to their condition on the second visit. It will be noted that about a third of all the items entered as unsatisfactory on the first visit were recorded by the nurse as improved when she returned.

The proportions of this improvement vary from 12 to 52 percent for the different services. Approximately the same proportions of the items show no change. Relatively few (less than 5 percent) of the items recorded as unsatisfactory grew worse, so far as these data reveal. The records are not designed, however, to show a downward change beyond a certain point. Markedly unsatisfactory is the final classification allowed by the code and such a condition growing worse, as it might conceivably do, would still be classified in this way.

In county B, 25 percent of the items recorded as unsatisfactory on the first call were given no grading by the nurse on her repeat calls. In county C, this omission of further grading occurred in 40 percent of the items first recorded as unsatisfactory. Why the nurse failed to enter her impressions on making a follow-up visit is debatable, since records that are to guide the future work or to serve as a measure of achievement must surely carry continued gradings on items recorded as unsatisfactory on the first visit. To be sure, many of these conditions may have improved, but the nurse's entries do not indicate

that they have, and records such as those used in this particular study are therefore deficient as indices of the nurses' accomplishment for over a fourth of the cases they served.

TABLE 2.—*Recorded changes between first and second visits in conditions originally unsatisfactory according to type of service*

| Type of case | Number of items unsatisfactory on first visit | Percentage distribution of items unsatisfactory on first visit according to condition on second visit | | | | |
|---|---|---|---|---|---|---|
| | | Total unsatisfactory items | Improvement recorded | No change recorded | No observation recorded | Recorded as worse |
| **COUNTY B** | | | | | | |
| All unsatisfactory items | 1,521 | 100 | 34.5 | 37.1 | 24.6 | 3.8 |
| Health supervision: | | | | | | |
| Infant | 424 | 100 | 45.8 | 34.2 | 15.8 | 4.2 |
| Preschool | 459 | 100 | 29.2 | 36.8 | 31.8 | 2.2 |
| School and adult | 43 | 100 | 11.6 | 32.6 | 53.5 | 2.3 |
| Maternity: | | | | | | |
| Antepartum | 359 | 100 | 34.3 | 48.7 | 12.8 | 4.2 |
| Postpartum | 41 | 100 | 22.0 | 26.8 | 48.8 | 2.4 |
| Tuberculosis | 164 | 100 | 26.8 | 28.7 | 40.9 | 3.6 |
| Communicable disease | 31 | 100 | 51.6 | 12.9 | 16.1 | 19.4 |
| **COUNTY C** | | | | | | |
| All unsatisfactory items | 3,961 | 100 | 31.8 | 27.4 | 39.7 | 1.1 |
| Health supervision: | | | | | | |
| Infant | 585 | 100 | 45.0 | 33.8 | 19.7 | 1.5 |
| Preschool | 125 | 100 | 23.2 | 36.0 | 32.8 | 8.0 |
| School and adult | 141 | 100 | 19.1 | 36.9 | 44.0 | ---------- |
| Maternity: | | | | | | |
| Antepartum | 387 | 100 | 30.5 | 56.9 | 9.8 | 2.8 |
| Postpartum | 62 | 100 | 42.0 | 40.3 | 14.5 | 3.2 |
| Tuberculosis | 79 | 100 | 17.7 | 65.8 | 12.7 | 3.8 |
| Communicable disease | 2,582 | 100 | 30.4 | 19.1 | 50.2 | 0.3 |

In table 3 is presented the number of satisfactory items that grew worse, and, for comparison, the number of unsatisfactory items that improved. In other words, the table shows the positive and negative changes that took place between visits, according to the nursing records. The net recorded change is given in the last column.

In county B the number of conditions recorded as having improved is the same as the number recorded as having grown worse. This statement, of course, is not applicable to each group of services. In some the greater number of items grew better, while in others the greater number grew worse, but a summary of the year's efforts shows that the degree of improvement recorded did not exceed the degree of deterioration. Perhaps the situations did improve more than these data indicate, but this analysis must deal perforce only with the facts as they appear on the records.

TABLE 3.—*Net changes recorded in number of unsatisfactory items between first and second visits*

| Type of case | Number of items recorded as unsatisfactory on first visit | Number of items recorded as improved | Number of items recorded as growing worse | | | Net changes recorded |
|---|---|---|---|---|---|---|
| | | | Total | Unsatisfactory to worse | Satisfactory to unsatisfactory | |
| **COUNTY B** | | | | | | |
| Total | 1,521 | 525 | 525 | 57 | 468 | |
| Health supervision: | | | | | | |
| Infant | 424 | 194 | 220 | 18 | 202 | −26 |
| Preschool | 459 | 134 | 74 | 10 | 64 | +60 |
| School and adult | 43 | 5 | 8 | 1 | 7 | −3 |
| Maternity: | | | | | | |
| Antepartum | 359 | 123 | 103 | 15 | 88 | +20 |
| Postpartum | 41 | 9 | 17 | 1 | 16 | −8 |
| Tuberculosis | 164 | 44 | 93 | 6 | 87 | −49 |
| Communicable disease | 31 | 16 | 10 | 6 | 4 | +6 |
| **COUNTY C** | | | | | | |
| Total | 3,961 | 1,261 | 478 | 43 | 435 | +783 |
| Health supervision: | | | | | | |
| Infant | 585 | 263 | 190 | 9 | 181 | +73 |
| Preschool | 125 | 29 | 47 | 10 | 37 | −18 |
| School and adult | 141 | 27 | 40 | | 40 | −13 |
| Maternity: | | | | | | |
| Antepartum | 387 | 118 | 67 | 11 | 56 | +51 |
| Postpartum | 62 | 26 | 15 | 2 | 13 | +11 |
| Tuberculosis | 79 | 14 | 11 | 3 | 8 | +3 |
| Communicable disease | 2,582 | 784 | 108 | 8 | 100 | +676 |

For county C the records show a net improvement. The number of items that grew better exceeds considerably the number that became worse, but the major proportion of those that improved are among the items pertaining to communicable disease. This trend may be attributed partly to the circumstance that many of the second visits in this county were made to communicable disease cases where the course of the illness is self-limited. As an illustration, a nurse going to put up a placard for scarlet fever might record a number of items on the case as unsatisfactory. When she returns to remove quarantine, the disease has terminated, taking with it those particular unsatisfactory conditions. Consequently, a series of improvements may be recorded for the case.

One must, of course, take into account the fact that some of the items appearing on the records may not yield to a nursing visit, perhaps not immediately, and perhaps not at all. Such physiological conditions as edema or nausea will not necessarily disappear because the patient enthusiastically carries out some hygienic rules of living advocated by the nurse. In such a situation the operation of other factors may be necessary before the nursing visits can be effective.

Still other unsatisfactory conditions are susceptible to change through a nurse's instructions, but not until some rearrangement takes place in the patient's affairs. If a nurse tells a tuberculous patient that the windows in his room should be kept open, the advice can usually be easily followed. But if she tells him that he should

eat more eggs and drink more milk, and he has no money with which to purchase these foods, then he is unable to follow her instructions, and the unsatisfactory condition of lack of proper food will not yield to the nursing visit. Short of advancing the patient an allowance, or inducing the department of welfare to furnish him what he needs, or getting a job for his wife, the nurse is bound to instruct vainly on this point of diet. Many circumstances garnered from actual nursing visits in all parts of the country could be used to illustrate this type of impasse which the nurses so frequently come upon.

In order to allow for these varying factors that interfere with a nurse's success in improving unsatisfactory conditions, the data have been classified into three groups by a committee which included a public health nurse, a physician, a statistician, and the author. The first group comprises those items which should change if the patient acts upon the advice of the nurse. Such things as exercise, exposure to fresh air, or regular eating habits go in this classification. The second group is made up of those physiological conditions which may or may not change as a result of the patient's acting upon the nurse's instructions. The third group covers those conditions for which, in a family of low economic status, a financial change will probably have to precede any other kind of change.

A few items were omitted altogether because of differences of opinion among the judges as to their classification. These are breast feeding, elimination, and medical examination. The items as finally classified are distributed in table 4 according to the changes recorded by the nurse on a second visit.

TABLE 4.—*Recorded changes between first and second visits in conditions originally unsatisfactory, according to their susceptibility to change through nursing instructions*

| Classification of recorded items | Number of items unsatisfactory on first visit | Percentage distribution of items unsatisfactory on first visit, according to condition on second visit | | | | |
|---|---|---|---|---|---|---|
| | | All unsatisfactory items | Improvement recorded | No change recorded | No observation recorded | Recorded as worse |
| **COUNTY B** | | | | | | |
| All unsatisfactory items | [1] 1,441 | 100 | 34.0 | 37.3 | 25.0 | 3.7 |
| Items directly susceptible to change | 848 | 100 | 32.8 | 37.0 | 26.3 | 3.9 |
| Items on physical condition not directly susceptible to change | 294 | 100 | 41.2 | 30.6 | 23.8 | 4.4 |
| Items in which change is limited by economic considerations | 299 | 100 | 30.4 | 44.8 | 22.4 | 2.4 |
| **COUNTY C** | | | | | | |
| All unsatisfactory items | [1] 3,779 | 100 | 31.0 | 27.3 | 40.6 | 1.1 |
| Items directly susceptible to change | 2,885 | 100 | 27.8 | 25.0 | 46.3 | 0.9 |
| Items on physical condition not directly susceptible to change | 644 | 100 | 48.8 | 29.3 | 20.2 | 1.7 |
| Items in which change is limited by economic considerations | 250 | 100 | 22.0 | 49.2 | 28.0 | 0.8 |

[1] A few items of doubtful classification were omitted.

It will be noted that those items representing physiological conditions show improvement in the largest proportion of unsatisfactory items. The reason for this finding is debatable. One person may maintain that the nurse's teaching undoubtedly contributed to this improvement. Another may point out that, since the majority of patients do not continue to grow worse, one would look for this degree of improvement to come about in the natural course of events. It is highly probable that both factors influenced the change. Be that as it may, a higher degree of improvement is recorded for this group than for those items of habit and behavior among which one would look for the most ready improvement, providing the patients were sufficiently impressed by what the nurse had to offer to try to follow her advice.

The proportion of improved cases is lowest in that group of items in which change is limited by economic conditions.

Table 4, then, offers a choice of inferences. It may be that the nurses do not make sufficiently accurate entries to permit any appraisal of their accomplishments. Or, if the records are exact and fulfill the purpose claimed for them, then it would appear that the nurses influence those items most readily susceptible to their advice no more than they do those less susceptible of improvement.

## SUMMARY

The case records of individuals served by nurses of two counties have been analyzed to ascertain whether they reveal changes in health conditions following nursing visits. The results are, of course, limited to the coded entries of "satisfactory" or "unsatisfactory" made for several conditions which the nurses observed and recorded at the time of their first and second visits. The interpretation of the findings is, therefore, dependent upon the accuracy and completeness with which the observed conditions were recorded.

The data reveal that about one-third of the conditions found unsatisfactory on the first visit are recorded as improved at the time of the second visit. About an equal number remain unchanged; a small number of the unsatisfactory conditions grew worse.

Over one-fourth of the situations entered as "unsatisfactory" on the first gradings were omitted in the second gradings. Either the nurses did not observe them on the second visit or forgot them when making out the record. The failure to record the condition for these situations at the time of the second visit prevents the use of this group of items in any estimate of the nurses' accomplishments. It is indicative of a definite weakness in the record-keeping procedure.

The number of satisfactory conditions that became unsatisfactory between the first and second visits almost approximates the number of conditions that improved. When items directly susceptible to change through nursing instructions are selected for a similar analysis, this same ratio holds.

## DISCUSSION

A number of factors might account for the fact that no noticeable progress in the recorded conditions shows up in the analysis of these data. The most likely one is that the nurses did not keep their records with sufficient accuracy to make the data actually reflect their accomplishments; or the records may not be designed properly to serve as an index of their achievements. A second likely explanation is that the nurses did bring about changes, but the type of analysis used was not the proper type to uncover these changes. If either of these possibilities is true, and the nurses from these two counties are typical, then the claim that such detailed records can be used to evaluate nursing services has not survived investigation. However, this does not mean that records should be discontinued, but that attention should be focused on keeping more meaningful records.

A third consideration might be that the analysis was limited to the results accomplished between the first and second home calls, whereas only a more intensive service could bring about an appreciable change. In that case, then, the work is characterized by a succession of starts, a large proportion of which are never carried forward to a finish, since in the two counties only 57 percent of the cases were seen more than once.[4] If on investigation this should prove to be the reason for the results shown, then more effective results from the nursing service might be obtained by limiting the number of individuals visited and giving a more intensive service to them.

The fact that the records as analyzed do not reveal that desirable changes took place following a nurse's visit is not presented as condemning nurses' accomplishments when they visit homes. However, the failure of their records to yield evidence of achievement should stimulate administrators to investigate the problem and determine whether the same is true for their own service, and, if so, to ascertain what steps should be taken to improve the situation.

[4] The proportions of cases given only one visit in the two counties were 67 percent in county B and 34 percent in county C. The proportions visited twice were 16 percent and 49 percent, respectively.

# HISTOPATHOLOGICAL CHANGES IN MICE INOCULATED WITH INFLUENZA VIRUS[1]

By A. A. NELSON, *Associate Medical Pathologist*, and J. W. OLIPHANT, *Passed Assistant Surgeon, United States Public Health Service*

Smith, Andrewes, and Laidlaw (*1*), in 1933, succeeded in serially passing through ferrets, with the development of nonfatal nasal and pulmonary lesions, a virus from human cases of influenza. In 1934 they (*2*) were able to use mice for passage of the virus; in this animal pulmonary but not nasal lesions were produced, and were often fatal. Francis (*3*) reported similar results. The papers of these workers give only short descriptions of the histopathological changes in mice. Because of the increasing use of mice in the study of influenza virus it was felt that a more detailed description would be of value.

## PREVIOUSLY REPORTED PATHOLOGICAL CHANGES IN MICE INOCULATED WITH INFLUENZA VIRUS

Andrewes, Laidlaw, and Smith (*2*) found the only constant postmortem changes in the lungs; in mice dying from infection the lungs were deep red and almost airless except for small emphysematous areas at the periphery, and usually all lobes were affected. In mice killed 3 to 6 days after infection all degrees of involvement were seen. The lesions consisted of areas of plum-colored consolidation, often with ill-defined margins. On section a good deal of fluid exuded from the cut surface. The upper dorsal portions of the lungs were most frequently attacked, and areas of hepatization could be seen apparently spreading out from the lung roots. In other mice only a tip of a lobe would be attacked, or there would be dusky red spots from 1 to 2 mm. in diameter. A strictly lobar distribution was unusual. Histologically, the larger bronchi contained desquamated epithelial cells and leucocytes with pyknotic nuclei. There was some edema and leucocytic infiltration around the bronchioles and blood vessels. The alveoli contained fluid and sometimes fibrin, red cells, and leucocytes. In stained smears there could be seen many polymorphonuclear leucocytes with pyknotic nuclei and mononuclear cells with vacuolated cytoplasm. Francis (*3*) noted a bluish gray or grayish red consolidation, spreading peripherally; microscopically there were edema, thickening of alveolar walls, perivascular small round cell infiltration, and variable numbers of polymorphonuclear leucocytes.

McIntosh and Selbie (*4*) stated briefly that in animals (mice and ferrets) dead as a result of inoculation the lungs grossly showed large areas of collapse and hemorrhage, and microscopically a great increase of mononuclear cells in the alveolar walls. In some animals the liver was fatty.

[1] From the Division of Pathology and the Division of Infectious Diseases, National Institute of Health.

Dal (*5*) found that mice infected intranasally or by inhalation with influenza virus showed a progressive destruction of the bronchial epithelium, disturbed blood circulation, and inflammation of the pulmonary tissue with hemorrhages, edema, and destruction of vascular walls. At the time of death of the animal most of the bronchial epithelium was destroyed, so that the process might be characterized as a destructive necrotizing endobronchitis and endobronchiolitis. This destruction of large portions of the bronchial epithelium was stated by Straub (*6*) to be the most conspicuous feature of the process in mice dying from influenza virus infection. The terminal and respiratory bronchioles were denuded of epithelium, widely dilated, and empty; the alveoli were collapsed and partly filled with edema fluid, and the alveolar capillaries were congested. Another conspicuous feature was peribronchiolar edema. Straub stated that polymorphonuclear infiltration was totally absent or present to a very slight extent only, and if present was always the effect of a secondary inflammatory process occurring in the diseased parts of the lung. In mice that survived infection a reparative proliferation of epithelium, beginning in the terminal bronchioles and extending into the alveoli, was seen.

Barberis (*7*) examined 31 mice inoculated with influenza virus, and found all forms of acute pulmonary inflammation, from congestion to hepatization. All animals showed a bronchitis, and the more severely involved ones a bronchopneumonia, with an exudate of fibrin, red cells, polymorphonuclears and lymphocytes, or even a lobar pneumonia. In addition, varying degrees of interstitial involvement were seen.

Rickard and Francis (*8*), by giving enormous doses of virus intraperitoneally, succeeded in producing nonfatal pulmonary lesions in some of their mice; the histopathology is not given.

Of these papers, only those of Dal, Barberis, and Straub give histopathological findings in any detail; the first paper was published in Russian and the second in Italian. Straub's paper contains excellent microphotographs.

## MATERIAL AND METHODS

In this study there were examined 115 white Swiss mice of about 15 grams weight; 73 of these had been inoculated by a variety of routes with the PR8 strain (*3*) of human influenza virus (originally obtained from Dr. Thomas Francis, Jr., of the Rockefeller Institute) concurrently maintained by serial passage through these and other similar mice, and the remaining 42 mice served as controls. The control mice were given either the saline (used in the earlier part of the study) or broth vehicle alone, or this plus noninfected lung, or given light ether anesthesia alone and not inoculated. The numbers

of mice in the various groups and the time at which they were examined are given in the following table.

| Time examined | Test animals | | | Control animals | | |
|---|---|---|---|---|---|---|
| | Intranasal | Conjunctival | Intraperitoneal | Intranasal | Conjunctival | Intraperitoneal |
| 2–5 hours | 4 | | | | | |
| 18–24 hours | 4 | | | 3 | | |
| 2 days | 8 | 1 | 1 | 5 | 1 | 1 |
| 3 days | 12 | 1 | 1 | 5 | 1 | 1 |
| 4 days | 14 | 1 | 1 | 16 | 1 | 1 |
| 5–6 days | 5 | | | | | |
| 7–8 days | 1 | 1 | 3 | 1 | 1 | 1 |
| 10–12 days | 2 | 3 | 1 | | 1 | 1 |
| 18–23 days | 5 | 1 | 1 | | 1 | 1 |
| 45–47 days | 2 | | | | | |
| Totals | 57 | 8 | 8 | 30 | 6 | 6 |
| | 73 | | | 42 | | |
| | 115 | | | | | |

The potency of the virus used was such that 0.03 to 0.05 cc. of a 1:10 to 1:50 suspension of infected lung in broth, inoculated intranasally under light ether anesthesia, would kill 80 percent or 90 percent of the mice in 3 to 6 days; a saline suspension of virus was not as potent. When the virus was inoculated by other routes, mice did not appear sick and no fatalities resulted.

The fact that the influenza virus was the lethal agent for the mice was shown by repeated protection tests with immune sera from rabbits; some of the sera were obtained from Dr. R. R. Hyde, of the School of Hygiene of Johns Hopkins University, and some were from our own Institute. A mixture of immune rabbit serum and virus, incubated for an hour, would uniformly protect mice, while a mixture of normal rabbit serum and virus, similarly incubated, would not protect.

Cultures of the lungs of dead animals on blood agar slants were sometimes sterile and sometimes showed varying organisms. No one type was regularly found; none resembled *H. influenzae*.

In tissue sections it was difficult to find bacteria, either with the routine hematoxylin-eosin-methylene blue stain, which shows them well, or with Gram's stain. Such few as were seen, either in the alveoli or bronchi, or in the bronchial exudate, were chiefly short Gram-negative bacilli. The control animals showed about as many bacteria as did those treated with virus. The exceptions as regards bacteria were 3 of the 57 mice receiving intranasal inoculations of virus; 2 of these died at 5 days and 1 at 3 days; microscopically, the lungs differed from all the other animals in showing large patches of predominantly polymorphonuclear exudation in addition to changes attributable to the virus; in these areas of polymorphonuclear exudation were numer-

ous bacteria of a variety of forms. It may be assumed that these cases represented superimposed bacterial infection of a virus-damaged lung, as no cases were seen in the intranasally inoculated control mice.

Most of the animals studied had been killed with ether and only a few minutes had elapsed before the tissues were put into the fixative (Orth's solution); the mice also inhaled the fixative while anesthetized. In fatal cases, animals were used for study only if they had been dead less than 3 hours. Sections were stained routinely by a hematoxylin-eosin-methylene blue technique, and with either a van Gieson or Gallego stain; the latter is especially good for mucin, elastic tissue, and mast cells. Sections of noses were made transversely in some animals and longitudinally in others.

### INTRANASAL INOCULATION

*Two hours and 5 hours.*—Two mice killed 2 hours after inoculation showed no gross or microscopic lesions in the lungs and trachea; the respiratory and olfactory epithelia of the nose were both normal. Of 2 mice killed at 5 hours, one showed the same findings as the mice killed after 2 hours, and the other showed in about one-third of one lobe a slight excess of polymorphonuclear and mononuclear leucocytes in the alveolar walls and alveoli; on the anterior wall of the midportion of the trachea there were a few small subepithelial collections of similar leucocytes, with infiltration of the epithelium. The respiratory and olfactory mucosae of the nose were normal. Neither of the animals killed after 5 hours showed gross lesions.

*Eighteen hours and 24 hours.*—At this time the first definite histological lesion appeared; grossly the lungs were negative from the exterior aspect (lungs were not sectioned before fixation). All 4 animals in this group showed a focal purulent bronchitis, with cellular exudation into the immediately adjacent alveoli, and slight but definite damage to the bronchial epithelium (figs. 1 and 2). The cellular exudate in the bronchi and alveoli was chiefly polymorphonuclear. The epithelial damage consisted of slight leucocytic infiltration, irregularity in height of the cells, vacuolation of cytoplasm with or without the presence of spherical oxyphilic hyaline bodies in the vacuoles, and various stages of coagulation necrosis of scattered individual cells, or small clumps, with nuclear pyknosis and fragmentation. Except for the polymorphonuclear exudation into the peribronchial alveoli, the parenchyma was essentially normal; there was a slight increase of polymorphonuclears in the alveolar capillaries, but no mononuclear interstitial infiltration and no alveolar exudate. Around a few bronchi slight edema and polymorphonuclear and mononuclear leucocyte infiltration were seen, and occasional bronchi showed a few polymorphonuclears within the wall. The changes in

the tracheal epithelium were similar to those in the bronchi but were less in degree. Respiratory and olfactory nasal mucosae were normal. Lesions in organs other than those of the respiratory tract will be considered separately at the end of this section.

*Two days.*—The 8 mice in this group showed a quite uniform picture. Essentially, there was the same focal acute bronchitis as was present at 1 day, but with more necrosis of the exudate cells and more damage to the epithelium; in addition, an interstitial exudate began to appear. The bronchi, instead of being stuffed with viable polymorphonuclears, began to show a layer of necrotic leucocytes and debris plastered against the epithelium (fig. 3). The epithelium was damaged in the same fashion as described for the 1-day stage, to a greater degree but still not severely; the damage was greatest in the larger bronchi, and some of the bronchioles were relatively uninvolved. Perivascular edema, with small to moderate numbers of polymorphonuclears, lymphocytes, and small macrophages [2] in the perivascular spaces, was now rather prominent. There was a moderate focal peribronchial accumulation of similar cells, but here the polymorphonuclears were fewer. The tracheal changes were similar to those in the bronchi, but were less marked. The lung parenchyma was for the most part practically normal, but patches of slight septal infiltration with small mononuclear cells and fewer polymorphonuclears were seen. A few alveoli contained edema fluid. Grossly the lungs at this stage showed little change; some showed congestion or one or two small dark red spots; they did not appear grossly edematous. In 3 of the 8 mice the noses were examined; the respiratory and olfactory epithelia were normal in all, but 2 of the 3 showed a slight to moderate infiltration of the lamina propria with lymphocytes and fewer polymorphonuclears.

*Three days.*—The bronchial exudate, bronchial epithelial damage, peribronchial cellular infiltration, perivascular edema and cellular infiltration, and tracheal changes were about the same as at 2 days, with some accentuation. Four of the 12 mice in this group showed no marked further changes; the other 8 showed in varying degrees two new factors—a diffuse edema and a diffuse interstitial (alveolar septal) exudate (figs. 4 and 5), in which small mononuclear cells predominated; small lymphocytes and small macrophages each made up about one-third of the exudate and polymorphonuclears the other

[2] We do not wish to go into a discussion of the genetic relationships of the various cells in mouse lung exudate. For practical purposes they can be divided into 4 common types and 2 less frequent types. Polymorphonuclear leucocytes, small lymphocytes, and large macrophages are easily enough identified and give no trouble; the fourth chief type is more difficult to classify and consists of cells of the size of a small lymphocyte to considerably larger, with an oval or reniform nucleus containing chromatin particles not as heavy as in the small lymphocyte, and cytoplasm which varies in amount and character. This fourth type appears in a variety of forms suggesting transitions to the large macrophage, and is for convenience called a small macrophage; also for convenience we have grouped together the small lymphocytes and small macrophages as small mononuclear cells. Plasma cells and large lymphocytes are less frequently seen than are the previous 4 groups, and mast cells are rare.

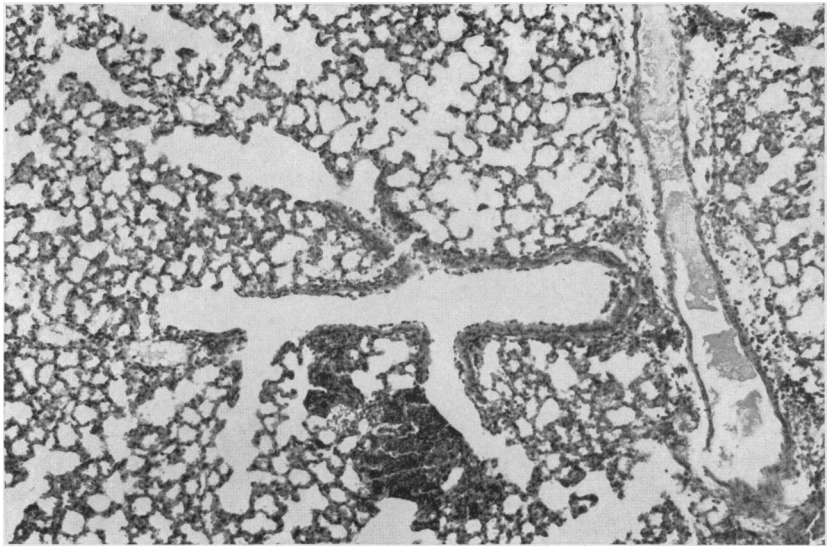

FIGURE 1.—14589. 1 day. Small peribronchiolar alveolar focus of polymorphonuclears; few polymorphonuclears in bronchiole. Note absence of septal and peribronchiolar, with early perivascular, cellular infiltration. Iron hematoxylin-van Gieson. × 80.

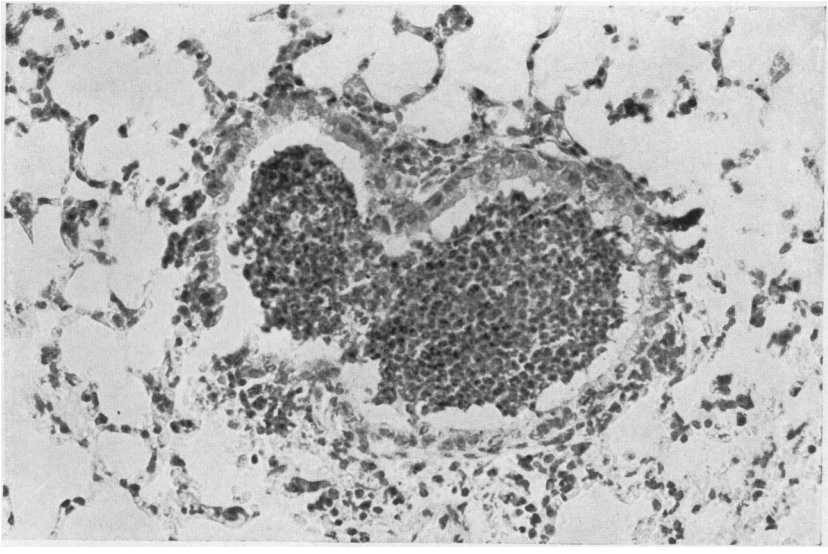

FIGURE 2.—14589. 1 day. Bronchiole filled with viable polymorphonuclears; epithelium only slightly damaged. No peribronchiolar or septal cellular infiltration. Iron hematoxylin-van Gieson. × 250.

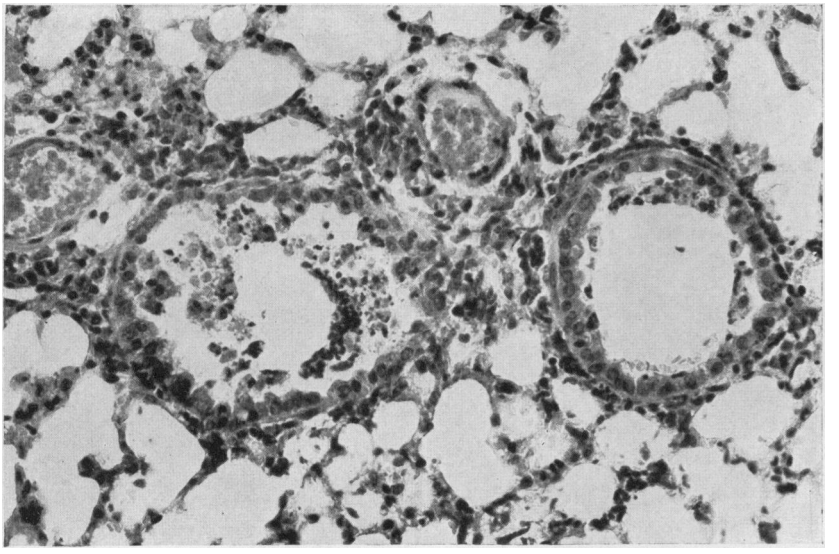

FIGURE 3.—14910. 2 days. Bronchiolar polymorphonuclear exudate is now largely necrotic and there is definite damage to the epithelium. Some perivascular, but very little peribronchiolar or septal cellular, infiltration. Iron hematoxylin-van Gieson. × 250.

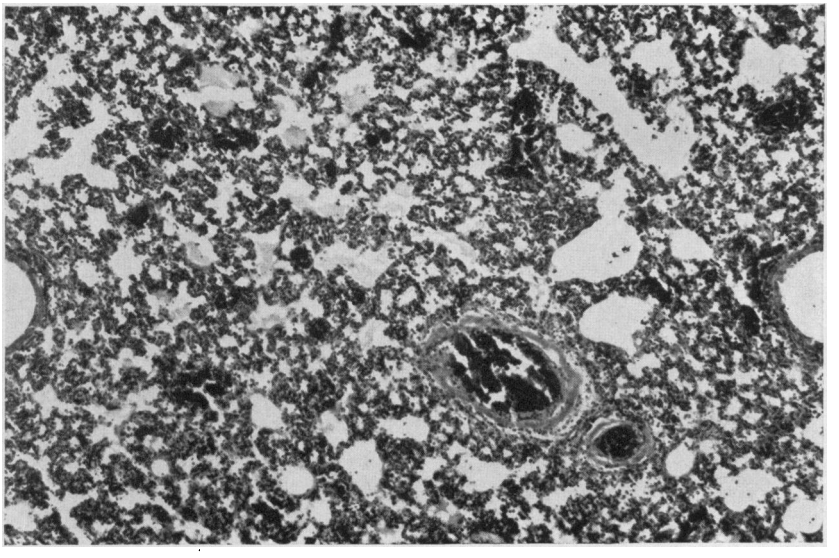

FIGURE 4.—14444. 3 days. Diffuse septal cellular infiltration: edema fluid in alveoli. Hematoxylin-eosin-methylene blue. × 80.

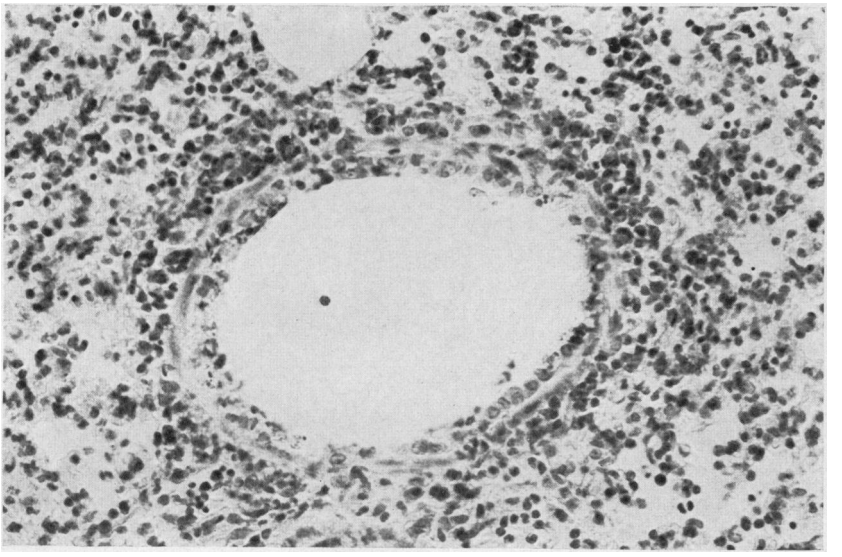

FIGURE 5.—14444. 3 days. Septal and peribronchial cellular infiltration, largely mononuclear. Small amount of necrotic exudate among and lying against epithelium; epithelium is markedly damaged and is denuded in spots. Edema fluid present but difficult to show with this stain. Iron hematoxylin-van Gieson. × 250.

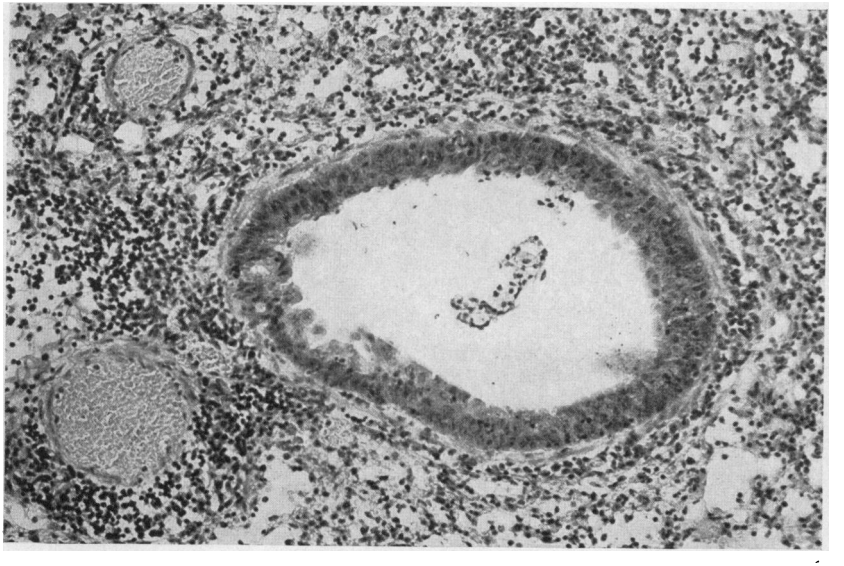

FIGURE 6.—15724. 4 days. Septal, peribronchial, and perivascular cellular infiltration, chiefly mononuclear. Bronchus shows proliferation of epithelium and a tendency to squamous metaplasia. Note nuclear fragments among epithelial cells. Edema fluid present but difficult to show with this stain. Iron hematoxylin-van Gieson. × 135.

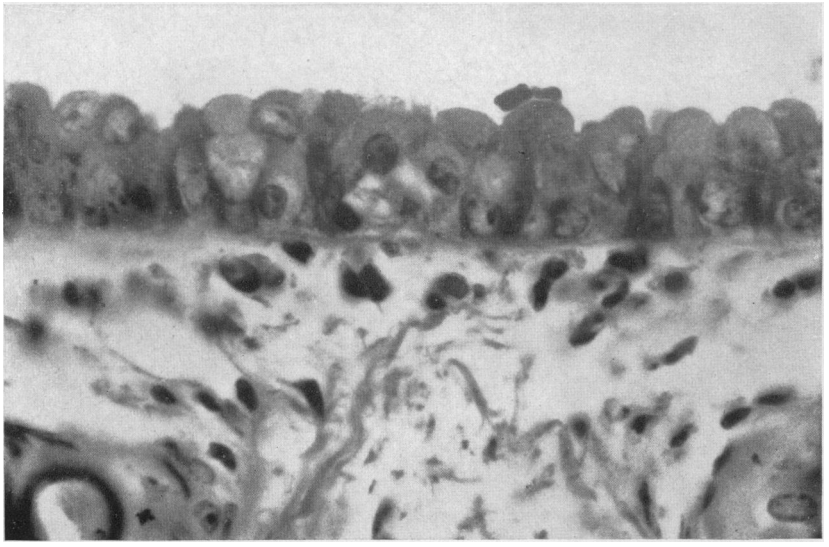

FIGURE 7.—14935. 4 days. Moderate squamous metaplasia of tracheal epithelium. Cilia are shown on a cell near the center of the photograph. Hematoxylin-eosin-methylene blue. × 900.

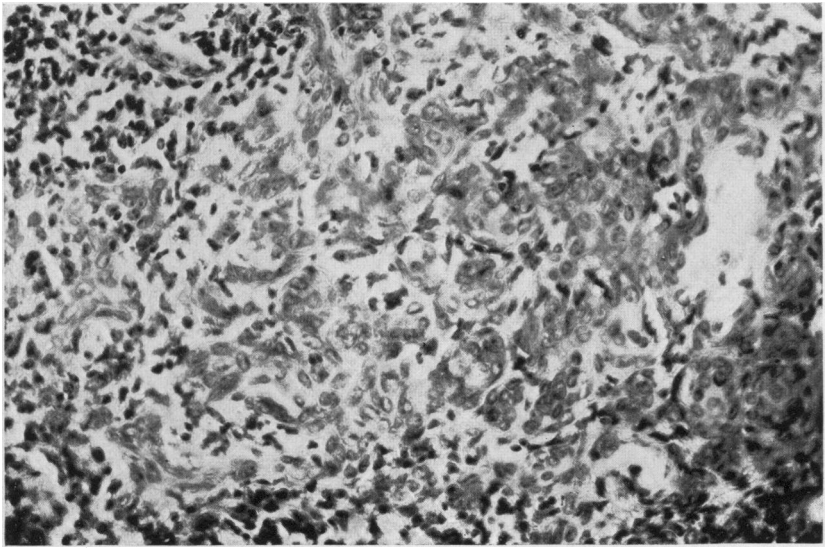

FIGURE 8.—15768. 18 days. Marked filling of alveoli with squamous epithelial cells. Iron hematoxylin-van Gieson. × 250.

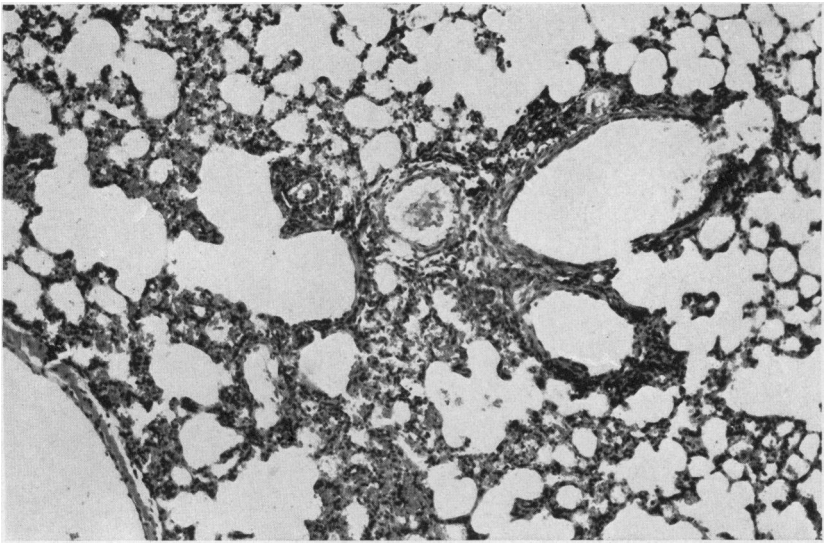

FIGURE 9.—15763. 18 days. Persistence of low and irregular epithelium in bronchi. Focal interstitial pneumonia. Iron hematoxylin-van Gieson. × 80.

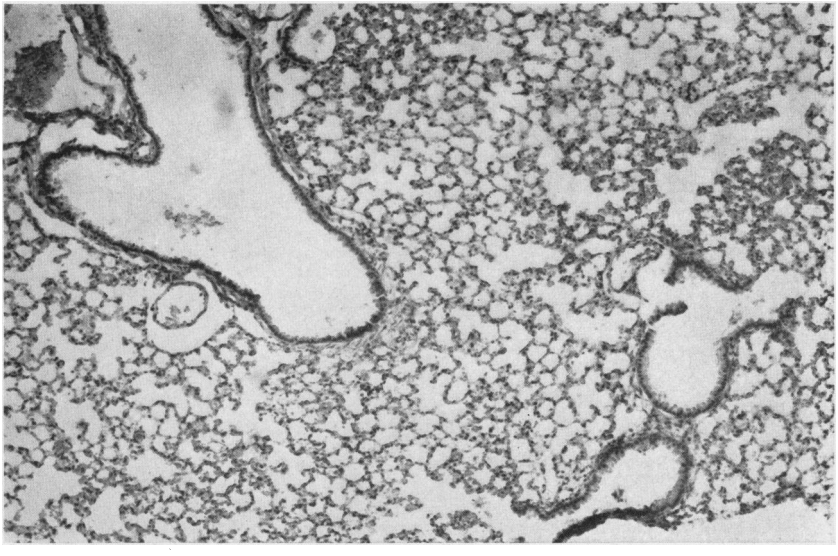

FIGURE 10.—15731. 3 days. Control animal given suspension of noninfected lung in broth intranasally. Normal lung. Iron hematoxylin-van Gieson. × 80.

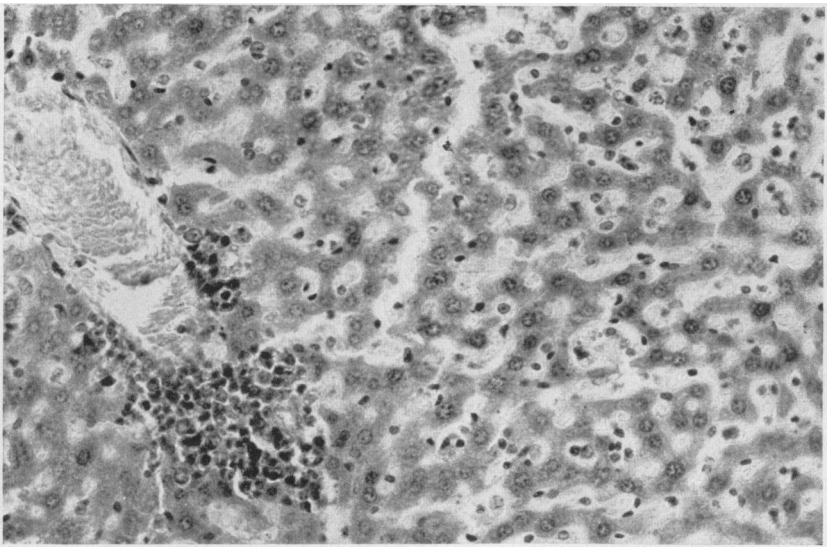

FIGURE 11.—15083. 4 days. Slight diffuse increase of small mononuclear cells in sinusoids of liver; focus of these cells around a central vein. Iron hematoxylin-van Gieson. × 250.

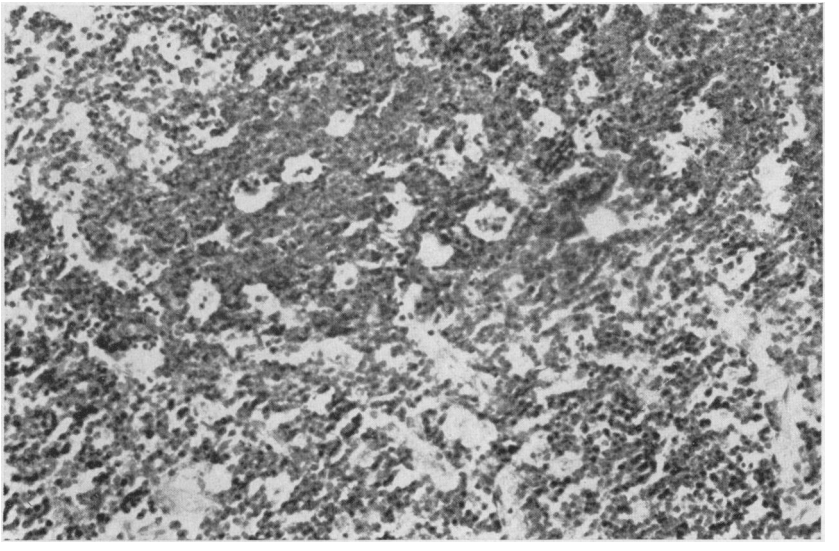

FIGURE 12.—15248. 4 days. Thymus. Reticulum cells of cortex (above) hyperplastic and contain numerous nuclear fragments. Iron hematoxylin-van Gieson. × 250.

one-third. Large macrophages were not increased (a variable number of small and large macrophages are seen in a normal young mouse lung). The most advanced processes in this group, in mice that had died at 3 days, represented the full-blown stage of the lung lesion caused by influenza virus, and will be described later in more detail. Grossly, the lungs of the 3-day mice usually showed consolidation, ranging from a few small spots to most of a single lobe to almost complete involvement of both lungs. The consolidation was of a dark or bluish red color and had a wet, gelatinous appearance. The peripheral portions of the lungs were least involved. Much fluid exuded on cutting the more consolidated lungs. Clinically the mice began to be cyanotic and to breathe deeply and spasmodically; this was evidently a result of the mechanical blockage of the aerating surfaces of the lung by the edema fluid, and this mechanical asphyxia probably played a large part in killing the mice. The noses of 8 of the 12 mice were examined; none showed any damage to the epithelium; in 2 there was slight polymorphonuclear and lymphocyte infiltration in the lamina propria, with fewer leucocytes in the epithelium; in 1 the nasal cavity contained a moderate amount of oxyphilic hyaline and granular material in which were a few mononuclear leucocytes and a moderate number of nuclear fragments.

*Four days.*—Most deaths among intranasally inoculated mice occurred on this day, with cyanosis, labored deep breathing, apathy, and anorexia. The lungs, except for an emphysematous zone ½ to 1 mm. in width along the margins, were dark or bluish red and had a wet, gelatinous appearance; on section much fluid exuded. Under a low magnification some air bubbles could be seen to be still present in the consolidated lung. Fourteen animals were examined microscopically at this stage; most had died or would shortly have died from the effects of the virus. There was a diffuse edema and hyperemia, and a diffuse moderate infiltration of the alveolar septa with about equal parts of small mononuclear cells, large macrophages (the latter had increased in number from the 3-day stage) and polymorphonuclears; a small percentage of the exudate cells were necrotic. The edema fluid sometimes contained so little protein that it was difficult to make out, but usually it could be easily seen. Perivascular edema was present, as was perivascular and peribronchial infiltration of moderate degree, with the same type of cellular exudate as in the interalveolar septa. The bronchial epithelial damage was more marked than on the second and third days. There were now multiple small areas where it was completely denuded; the remaining epithelium was infiltrated by leucocytes and moderately to markedly flattened, with individual epithelial cells in varying stages of necrosis. It was covered by an irregular thin layer of necrotic cellular exudate and fewer desquamated epithelial cells. Some bronchioles were filled

with necrotic cellular exudate. A few bronchi showed proliferation rather than reduction in amount of epithelium (fig. 6). In the earlier stages the larger bronchi had shown the most epithelial damage; now it was the smaller bronchi and bronchioles, although in the large bronchi damage was quite marked, and greater than in the trachea, where the epithelium did not reach the point of becoming denuded. Frequently a slight tendency to squamous metaplasia of the epithelium was noted in the bronchi (fig. 6) and occasionally in the trachea (fig. 7). Cellular infiltration in the trachea was in the lamina propria and not perimuscular as in the bronchi. The pleura often showed slight leucocytic infiltration and slight heaping and rounding of the mesothelial cells.

The noses of 12 of these 14 mice were examined. The respiratory and olfactory epithelia were normal in all. One mouse showed a few small foci of polymorphonuclear infiltration in the lamina propria of the septum, and another a moderate amount of oxyphilic amorphous material containing a few leucocytic fragments in the nasal cavity.

*Five and 6 days.*—Two mice dying at 5 days had a superimposed bacterial infection, as described in the section on material and methods. Three mice dying at 6 days showed lungs practically identical with those dying at 4 days and described in the above paragraph.

*Over 6 days.*—Clinically, the 10 or 20 percent of intranasally inoculated mice not dying after 6 days showed the same symptoms (dyspnea, apathy, cyanosis) as those fatally involved, but to a lesser degree. The symptoms gradually disappeared and most of these animals would live indefinitely thereafter. It was not a primary purpose of this study to follow this group and determine what secondary changes took place; however, 10 mice were studied at various intervals. One examined at 8 days differed only in degree from those dying at 4 days. Two mice examined at 12 days, 3 at 18 days, and 2 at 23 days were strikingly different; pneumonic involvement was now patchy and the degree of consolidation greater where present. All of these lungs showed from small to large areas of squamous metaplasia of the alveolar epithelium (fig. 8); sometimes the alveoli were solidly filled and sometimes simply lined by squamous cells, with a little leucocytic debris in the center. Some of these animals had bronchi stuffed with polymorphonuclears, while others had very few. The bronchial epithelium in some areas appeared normal, while in other areas it was slightly to markedly flattened and irregular (fig. 9); this change did not appear related to the presence of cellular exudate within the bronchus or to the presence of pneumonia in the vicinity. It appeared as if the epithelium had in the acute stage of infection received an injury from which it could not completely recover. Two mice examined at 45 days showed focal pneumonic involvement similar to that

just described but considerably less in extent, suggesting that eventually the residual infection might practically disappear.

*Respiratory tract in control mice.*—Thirty mice were given, under light ether anesthesia similar to that given the test mice, similar intranasal doses of broth or saline solution; some doses did and some did not contain normal mouse lung in the same proportion as those given to the test animals. One group of 5 mice was given ether alone. Stated briefly, lesions were absent in 23 of the 30 mice (fig. 10); in the remaining 7 they were very minor when compared with those in the test animals. One 2-day mouse, one 3-day mouse, and five 4-day mice showed one or more of the following changes: Slight focal septal infiltration with mononuclear and polymorphonuclear leucocytes, slight (in 1 case focally marked) peribronchial and perivascular infiltration with chiefly mononuclear cells, or occasional very small foci of polymorphonuclear exudation into alveoli. Only 1 of the 7 mice showed any damage to the bronchial epithelium; this was in a small area of bronchopneumonia, and this mouse was also the only one showing any cellular exudate in the bronchial lumina. One mouse showed an occasional polymorphonuclear among the tracheal and bronchial epithelial cells; the tracheas, except for this, were negative. No edema was seen in any of the controls, and grossly they all appeared normal. Respiratory and olfactory epithelia were examined in 18 of the 30, and all were negative.

*Organs other than respiratory tract.*—In general, slight lesions probably attributable to the virus could be made out in the liver, spleen, thymus, and kidney, with none in the adrenal, brain, thyroid, heart, pancreas, or gastrointestinal tract. Organs were examined in the following numbers of animals in the intranasally inoculated group.

| Organ | Test | Control | Organ | Test | Control |
|---|---|---|---|---|---|
| Heart | Nearly all | Nearly all | Brain | 19 | 17 |
| Liver | 29 | 26 | Thymus | 8 | 8 |
| Spleen | 30 | 26 | Thyroid | 6 | ---- |
| Pancreas | 17 | 14 | Small intestine | 6 | ---- |
| Kidney | 22 | 15 | Esophagus | 5 | ---- |
| Adrenal | 17 | 11 | | | |

The liver in 13 of the 29 test animals in which it was examined showed a slight or moderate increase in the number of small mononuclear cells in the sinusoids and portal spaces and around the central veins (fig. 11); polymorphonuclears were less increased in number. This change was present in only 4 of the livers of the 26 control mice examined. The spleen showed no variation in size between test and control animals; microscopically the only difference was that in the test animals the follicles contained moderate to large numbers of nuclear fragments while in the controls there were small to moderate

numbers. In both the follicles were large to very large, with indistinct germinal centers; there were small to moderate numbers of myeloid cells, slight to moderate peritrabecular hyperplasia, and no hemosiderosis. The thymus showed a distinct difference between test and control animals; in the former 2 thymuses showed slight and 4 moderate reticulum cell hyperplasia, with corresponding numbers of nuclear fragments in and around the reticulum cells (fig. 12); none of the control animals showed these changes. The kidneys of 3 test mice showed slight focal fatty change and those of 2 other test mice showed slight focal hyaline granular change in the convoluted tubular epithelium; none of the control animals showed this change. The kidneys of 2 test and 3 control mice showed slight focal interstitial infiltration with small mononuclear cells. The brain sections in both control and test animals were uniformly entirely normal; no encephalitic or meningitic lesions of any kind were present.

### INOCULATIONS BY OTHER ROUTES

It is well known that influenza virus given in any way except directly into the air passages does not cause fatal lesions in mice, and only by using enormous doses (*8*) are gross pulmonary lesions caused at all; however, it was decided to see what histopathological changes might occur after conjunctival and intraperitoneal inoculation of the virus.

*Conjunctival inoculation.*—A dose of 0.03 cc. of a suspension similar to that used in the nose was dropped into the conjunctival sacs; control animals were given the broth vehicle only. All 6 control animals and the 2-, 3-, 4-, and 7-day test animals showed no lesions. At 10 days, 1 mouse was negative and 2 others showed moderate focal interstitial, peribronchial, and perivascular infiltration with mononuclear cells predominating. A few alveoli contained edema fluid. One mouse examined at 22 days showed similar cellular infiltration. There was no damage to the respiratory epithelium (bronchi, trachea, nose) in any of these mice. In one of the 10-day mice with lung lesions the heart showed a few myocardial and subendothelial foci of lymphoid cells and macrophages up to $50 \times 100 \mu$, a rather unusual finding. Spleens were examined only on the three 10-day test animals, and showed nothing of note beyond moderately active centers in the follicles. Sections of brains were examined in all test and control animals, and the orbits in most; no lesions could be seen.

*Intraperitoneal inoculation.*—Doses of 0.5 cc. of a suspension similar to that used in the nose were injected into the peritoneal cavity; control animals were given the broth vehicle. All of the test and control animals, except the 2-day control mouse, showed lesions consisting of slight to moderate focal peribronchial and perivascular infiltration,

chiefly with mononuclear cells, and slight focal or diffuse septal infiltration with mononuclears and polymorphonuclears. The tracheal epithelium was normal; the lamina propia showed slight to moderate focal infiltration, chiefly with mononuclear cells. In one of the 8-day test animals there was slight damage to the bronchial epithelium. None showed edema. The lesions were more marked in the test animals, but there was no great difference; possibly their production was related chiefly to the relatively large amount of inoculum used. Nasal epithelium and brain were examined in all of these animals and showed no lesions.

## SUMMARY

Intranasal instillation of the PR8 strain of influenza virus, as carried on in this study, produced in mice an edematous pneumonic process which was fatal in about 4 days in 80 to 90 percent of the mice. Study of 57 test mice showed that, in general, at 1 day after inoculation there was a focal polymorphonuclear exudation in the smaller bronchi, and a few small peribronchial alveolar foci of polymorphonuclears; there was an early stage of damage to the bronchial epithelium, and practically no septal infiltration. At 2 days the process was not much greater in extent, but the polymorphonuclear exudate was in large part necrotic, and damage to the bronchial epithelium was greater; perivascular edema and peribronchial and perivascular infiltration, chiefly with small mononuclear cells, were appearing. At 3 days to 4 days, when the animals began to appear ill, a diffuse edema appeared, together with a slight to moderate diffuse septal and alveolar infiltration with an exudate of about two-thirds small mononuclear cells and one-third polymorphonuclears; the bronchial epithelial damage had progressed to the point where small areas were denuded, and there was more peribronchial and perivascular cellular infiltration. Animals not dying within 3 to 6 days nearly always lived indefinitely thereafter, with persisting clinical symptoms and varying degrees of chronic pneumonic processes; squamous epithelial metaplasia in the alveoli was a prominent feature and bronchial epithelial damage persisted. The changes in the trachea were similar to those in the bronchi but less marked. Of 30 control animals, 23 showed no lesions and in the remaining 7 there were very minor lesions as compared to those in the test animals.

The noses of 26 test animals were examined; the respiratory and olfactory epithelia showed no lesions in any; in 5 mice there was slight focal mononuclear and polymorphonuclear infiltration of the lamina propria of the mucosa; the noses of 18 control mice showed no lesions. Slight lesions were present in the liver, spleen, thymus, and kidney in the test animals, with none in the adrenal, brain, thyroid, heart,

pancreas, or gastrointestinal tract. Small series of mice given conjunctival or intraperitoneal inoculations of virus showed more lesions than did control animals, although these additional lesions were slight and in no case were the animals ill.

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## THE MAJOR CAUSES OF DEATH, INCREASE IN LIFE EXPECTANCY, AND POPULATION CHANGES IN THE UNITED STATES

According to figures furnished by the Bureau of the Census,[1] nine causes, including groups of closely related causes, accounted for almost three-fourths (72 percent) of all deaths in the United States in 1937. This fact has considerable medical and public health significance, as it draws the line of battle for a concerted and intensified attack against diseases and conditions which challenge curative and preventive medicine and to which greater attention should be given.

In addition to the number and percent of all deaths among all ages attributed to the nine leading causes, figures are given in table 1 for the nine most important causes of death by broad age groups from infancy (under 1 year) to advanced age. From these figures it is apparent that the relative importance of different diseases from the standpoint of mortality varies greatly at different age periods during the span of life. It will be noted that "influenza and pneumonia" stands high in the list for all age groups except old age and causes the largest percentage of deaths in the age groups 1–4 and 5–19. Heart disease is the most important cause of death numerically for all ages, for the adult age groups (20–59 years), and for the old age group (60

[1] The Killers. Vital Statistics, Special Reports, vol. 7, No. 50, September 18, 1939.

years and over). Diarrhea and enteritis, whooping cough, and diphtheria still take too large a toll of lives in the childhood group, in view of the progress made in the control of these diseases, while congenital malformations and diseases of early infancy cause more than 51 percent of the deaths under 1 year of age, emphasizing the necessity for greater efforts in making childbirth safer for the baby as well as in the preservation of infant lives.

TABLE 1.—*Number and percent of deaths from the principal causes, by broad age groups, United States, 1937*

| Cause of death | All ages | |
|---|---|---|
| | Number | Percent |
| All causes | 1,450,427 | 100.0 |
| Diseases of the heart | 346,401 | 23.9 |
| Influenza and pneumonia (all forms) | 148,014 | 10.2 |
| Cancers and other malignant tumors | 144,774 | 10.0 |
| Nephritis | 102,877 | 7.1 |
| Cerebral hemorrhage and softening | 99,577 | 6.9 |
| Tuberculosis (all forms) | 69,324 | 4.8 |
| Congenital malformations and diseases of early infancy | 63,349 | 4.4 |
| Motor-vehicle accidents | 39,643 | 2.7 |
| Diabetes mellitus | 30,587 | 2.1 |
| Other causes | 405,881 | 28.0 |
| **Infant mortality (under 1 year)** | | |
| All causes | 119,931 | 100.0 |
| Congenital malformations and diseases of early infancy | 61,676 | 51.4 |
| Influenza and pneumonia (all forms) | 20,286 | 16.9 |
| Diarrhea and enteritis (under 2 years) | 11,672 | 9.7 |
| Whooping cough | 3,171 | 2.6 |
| Syphilis | 1,522 | 1.3 |
| Diseases of thymus gland | 1,140 | 1.0 |
| Dysentery | 1,074 | .9 |
| Accidental mechanical suffocation | 970 | .8 |
| Hernia, intestinal obstruction | 953 | .8 |
| Other causes | 17,467 | 14.6 |
| **Childhood (1–4 years)** | | |
| All causes | 34,392 | 100.0 |
| Influenza and pneumonia (all forms) | 9,236 | 26.9 |
| Diarrhea and enteritis (under 2 years) | 2,734 | 7.9 |
| Whooping cough | 1,638 | 4.8 |
| Diphtheria | 1,397 | 4.1 |
| Tuberculosis (all forms) | 1,303 | 3.8 |
| Accidental burns (except conflagration) | 1,173 | 3.4 |
| Diarrhea and enteritis (2 years and over) | 1,145 | 3.3 |
| Motor-vehicle accidents | 1,137 | 3.3 |
| Congenital malformations and diseases of early infancy | 759 | 2.2 |
| Other causes | 13,870 | 40.3 |

| Cause of death | Youth (5–19 years) | |
|---|---|---|
| | Number | Percent |
| All causes | 58,519 | 100.0 |
| Influenza and pneumonia (all forms) | 7,374 | 12.6 |
| Motor-vehicle accidents | 6,381 | 10.9 |
| Tuberculosis (all forms) | 5,635 | 9.6 |
| Appendicitis | 3,950 | 6.8 |
| Diseases of the heart | 3,735 | 6.4 |
| Drowning | 2,528 | 4.3 |
| Puerperal state | 1,353 | 2.3 |
| Nephritis | 1,304 | 2.2 |
| Fall (accidental) | 1,201 | 2.1 |
| Other causes | 25,049 | 42.8 |
| **Adult (20–59 years)** | | |
| All causes | 508,806 | 100.0 |
| Diseases of the heart | 95,121 | 18.7 |
| Cancers and other malignant tumors | 55,872 | 11.0 |
| Influenza and pneumonia (all forms) | 52,493 | 10.3 |
| Tuberculosis (all forms) | 50,645 | 10.0 |
| Nephritis | 28,939 | 5.7 |
| Cerebral hemorrhage and softening | 24,309 | 4.8 |
| Motor-vehicle accidents | 23,313 | 4.6 |
| Suicide | 14,196 | 2.8 |
| Puerperal state | 9,410 | 1.8 |
| Other causes | 154,508 | 30.4 |
| **Old age (60 years and over)** | | |
| All causes | 727,668 | 100.0 |
| Diseases of the heart | 246,570 | 33.9 |
| Cancers and other malignant tumors | 87,453 | 12.0 |
| Cerebral hemorrhage and softening | 74,754 | 10.3 |
| Nephritis | 72,042 | 9.9 |
| Influenza and pneumonia (all forms) | 58,506 | 8.0 |
| Arteriosclerosis (except coronary arteries) | 20,585 | 2.8 |
| Diabetes mellitus | 20,550 | 2.8 |
| Fall (accidental) | 17,743 | 2.4 |
| Tuberculosis (all forms) | 11,061 | 1.5 |
| Other causes | 118,404 | 16.3 |

In contrast, and as is well known, diseases of the heart, cancer, nephritis, and diabetes mellitus are less important causes of death at the younger ages than during the adult and advanced age periods. Tuberculosis is an important cause of death in every age except infancy and motor-vehicle accidents in every age period given except the youngest and oldest, standing highest during the period of youth, 5–19 years.

Dr. W. Thurber Fales, Director of the Bureau of Vital Statistics of the Baltimore City Health Department, has suggested [2] that a narrower age grouping would bring out important mortality facts better with reference to certain periods of life, and he proposes 7 age groups based on changes in activity and environment, as follows:

Under 1 year (infancy).
1–4 years (early childhood, preschool).
5–14 years (childhood, school).
15–24 years (adolescent and early adult (entrance into industry and beginning of childbearing period)).
25–44 years (adult, childbearing and most active production period).
45–64 years (middle age).
65 and over (old age).

Doctor Fales believes that this grouping, in terms of certain natural periods of the life span, would be of value to public health programs, as the narrower age groups have distinct distributions of causes of sickness and mortality, and programs of education and prevention could be more effectively directed to the important causes and to persons in the age classifications grouped according to activity, environment, and biological functions. Table 2, furnished by Doctor Fales, presents the 1937 mortality data for certain principal causes by the narrower age classes, and shows, by comparison with table 1, the changes in the relative importance of certain causes that result in such age grouping.

There has been a considerable change in the rates and relative positions of the leading causes of death, for the total population, in the United States since 1900, as shown in table 3. Influenza and pneumonia combined heads the list in 1900 and drops to second place in 1937, while considered separately, pneumonia came second in 1900 and fourth in 1937. Tuberculosis, which occupied second place in 1900 (first place with pneumonia and influenza considered separately), had dropped to sixth place in 1937, and cancer moved up from seventh place to third (second with pneumonia and influenza considered separately). In 1937, seventh place has been taken by motor-vehicle accidents, a relatively new cause of death which, although not strictly a public health problem, has overshadowed the common communicable diseases in numerical importance with respect to mortality. The drop in the death rate for typhoid fever from 35.9 in 1900 to 2.1 in

[2] In a personal communication to Dr. H. L. Dunn, Chief Statistician for Vital Statistics, Bureau of the Census.

1937, and in the rate for diarrhea and enteritis from 133.2 to 14.6, is an accurate measure of the achievement in environmental sanitation during that period.

TABLE 2.—*Number and percent of deaths from the principal causes, by narrow age groups, United States, 1937*

| Cause of death | School (5–14 years) | |
|---|---|---|
| | Number | Percent |
| All causes | 31,778 | 100.0 |
| Influenza and pneumonia (all forms) | 4,202 | 13.2 |
| Motor-vehicle accidents | 2,991 | 9.4 |
| Appendicitis | 2,476 | 7.8 |
| Diseases of the heart | 2,063 | 6.5 |
| Tuberculosis (all forms) | 1,653 | 5.2 |
| Drowning | 1,490 | 4.7 |
| Diseases of the pharynx and tonsils | 736 | 2.3 |
| Diphtheria | 696 | 2.2 |
| Nephritis | 682 | 2.1 |

| Cause of death | Adolescent (15–24 years) | |
|---|---|---|
| | Number | Percent |
| All causes | 62,099 | 100.0 |
| Tuberculosis (all forms) | 11,070 | 17.8 |
| Motor-vehicle accidents | 7,800 | 12.6 |
| Influenza and pneumonia | 6,952 | 11.2 |
| Diseases of the heart | 3,725 | 6.0 |
| Puerperal state | 3,608 | 5.8 |
| Appendicitis | 2,648 | 4.3 |
| Homicide | 2,214 | 3.6 |
| Drowning | 1,726 | 2.8 |
| Suicide | 1,634 | 2.6 |

| Cause of death | Adult (25–44 years) | |
|---|---|---|
| | Number | Percent |
| All causes | 192,694 | 100.0 |
| Tuberculosis (all forms) | 27,530 | 14.3 |
| Diseases of the heart | 23,510 | 12.2 |
| Influenza and pneumonia (all forms) | 22,527 | 11.7 |
| Cancers and other malignant tumors | 14,424 | 7.5 |
| Motor-vehicle accidents | 10,877 | 5.6 |
| Nephritis | 8,577 | 4.5 |
| Puerperal state | 7,006 | 3.6 |
| Suicide | 6,731 | 3.5 |
| Homicide | 5,093 | 2.6 |

| Cause of death | Middle age (45–64 years) | |
|---|---|---|
| | Number | Percent |
| All causes | 406,033 | 100.0 |
| Diseases of the heart | 107,740 | 26.5 |
| Cancers and other malignant tumors | 60,063 | 14.8 |
| Influenza and pneumonia (all forms) | 35,954 | 8.9 |
| Cerebral hemorrhage and softening | 30,210 | 7.4 |
| Nephritis | 29,997 | 7.4 |
| Tuberculosis (all forms) | 19,712 | 4.9 |
| Diabetes mellitus | 12,063 | 3.0 |
| Motor-vehicle accidents | 10,475 | 2.6 |
| Suicide | 7,932 | 1.9 |

| Cause of death | Old age (65 years and over) | |
|---|---|---|
| | Number | Percent |
| All causes | 602,389 | 100.0 |
| Diseases of the heart | 208,388 | 34.6 |
| Cancers and other malignant tumors | 68,187 | 11.3 |
| Cerebral hemorrhage and softening | 63,779 | 10.6 |
| Nephritis | 61,590 | 10.2 |
| Influenza and pneumonia (all forms) | 48,738 | 8.1 |
| Arteriosclerosis (except coronary arteries) | 19,257 | 3.2 |
| Falls (accidental) | 16,080 | 2.7 |
| Diabetes mellitus | 15,743 | 2.6 |
| Tuberculosis (all forms) | 7,376 | 1.2 |

Figure 1 shows graphically the percentage distribution of deaths from tuberculosis, influenza and pneumonia, cancer, diseases of the heart, motor-vehicle accidents, and for all causes by interrupted 5-year age groups. These graphs show clearly that tuberculosis and motor-vehicle accidents are more frequent causes of death in early adult life than at other ages, that "influenza and pneumonia" is relatively

important in infancy and throughout adult life, and that cancer and diseases of the heart are relatively more important in the later years.

Figure 2 shows the trends of the crude death rates (per 100,000 population) for selected causes in the expanding registration area of the United States for 1900 to 1937, and figure 3, with the death rates plotted on semilogarithmic charts, shows the rates of increase or decrease for certain important causes of death.

TABLE 3.—*Changes in the leading causes of death in the United States, 1900–1937. Death rates per 100,000 population in the registration areas of 1900 and 1937*

| | *Death rate per 100,000 population* |
|---|---|
| *1900* | |
| 1. Influenza and pneumonia | 207.2 |
| 2. Tuberculosis (all forms) | 201.2 |
| 3. Diarrhea and enteritis | 133.2 |
| 4. Heart disease | 111.2 |
| 5. Nephritis and Bright's disease | 89.0 |
| 6. Cerebral hemorrhage (apoplexy) | 67.5 |
| 7. Cancer | 63.0 |
| 8. Bronchitis | 45.7 |
| 9. Diphtheria | 43.3 |
| Typhoid fever | 35.9 |
| *1937* | |
| 1. Heart diseases (including diseases of the coronary arteries and angina pectoris) | 268.1 |
| 2. Influenza and pneumonia | 114.5 |
| 3. Cancer | 112.0 |
| 4. Cerebral hemorrhage | 86.5 |
| 5. Nephritis | 79.6 |
| 6. Tuberculosis (all forms) | 53.6 |
| 7. Motor-vehicle accidents | 30.7 |
| 8. Diabetes | 23.7 |
| 9. Arteriosclerosis | 17.8 |
| Diarrhea and enteritis | 14.6 |
| Typhoid fever | 2.1 |

These graphs show that the crude death rates for the major causes differed markedly during the period 1900 to 1937, in both absolute figures (arithmetic change) and in rates of change (semilogarithmic terms). While the death rate from tuberculosis has dropped steadily and almost continuously during the entire period, the rate of decline has been greater since 1918 than during the earlier years. The death rate for influenza and pneumonia has also declined, but the rate of decrease has been slower and less regular than that for tuberculosis. Similarly, the death rate for all causes shows a gradual but irregular decline since 1900. On the other hand, mortality rates for diseases of the heart and cancer have risen steadily during the period, as has the

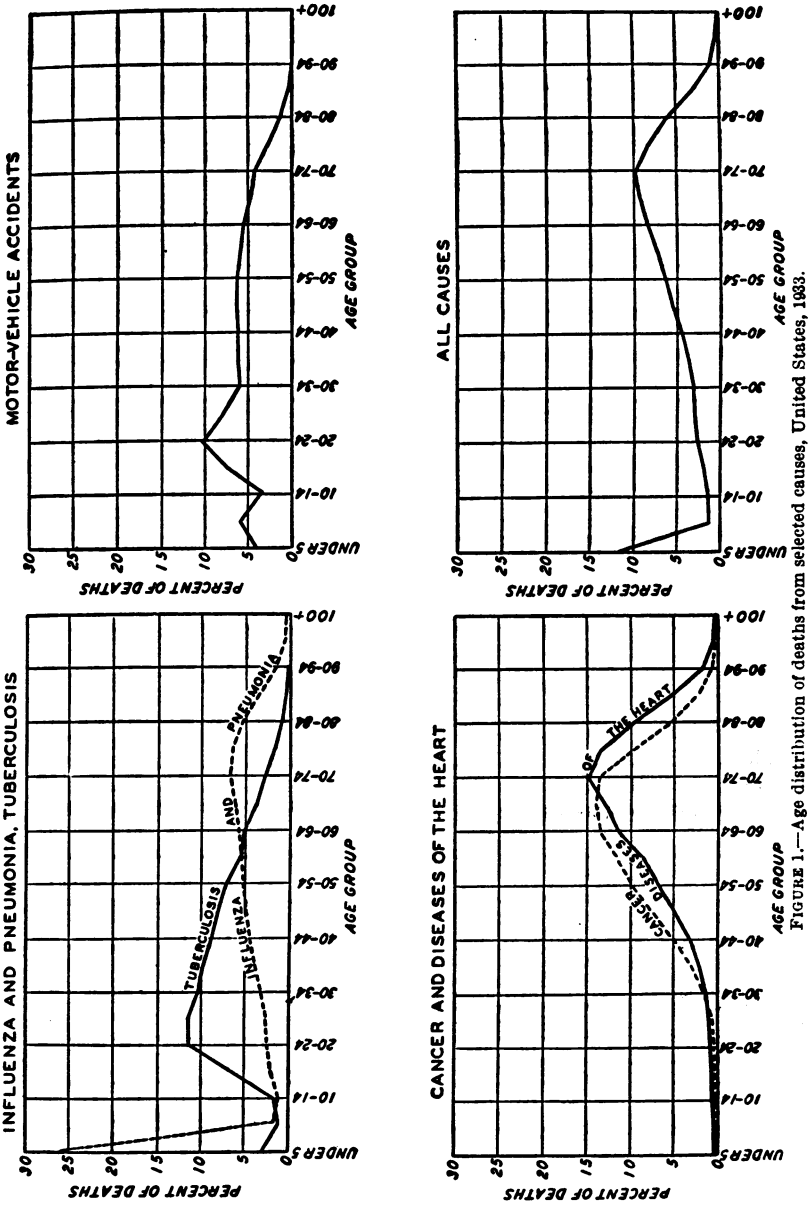


FIGURE 1.—Age distribution of deaths from selected causes, United States, 1933.

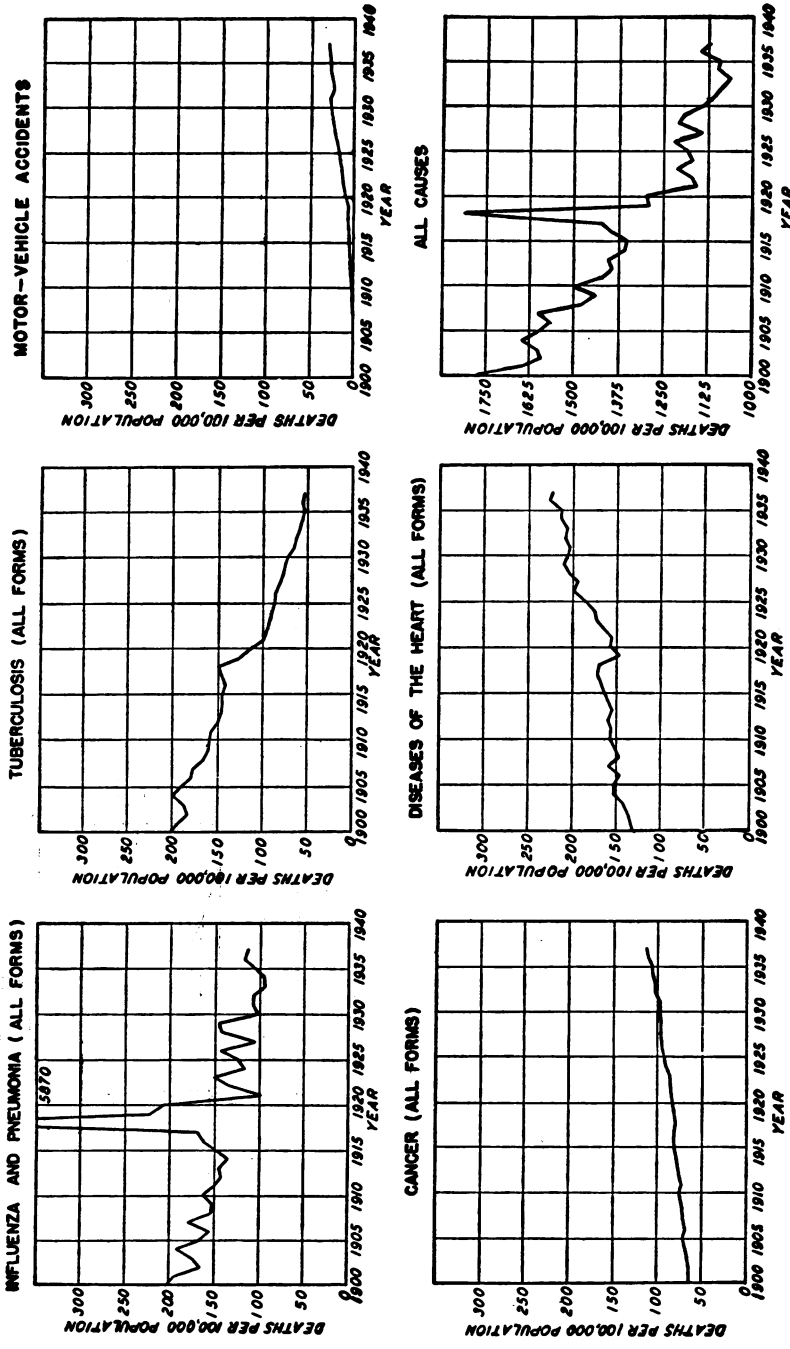


FIGURE 2.—Trends of death rates (per 100,000 population) for selected causes, United States registration area, 1900–1937.

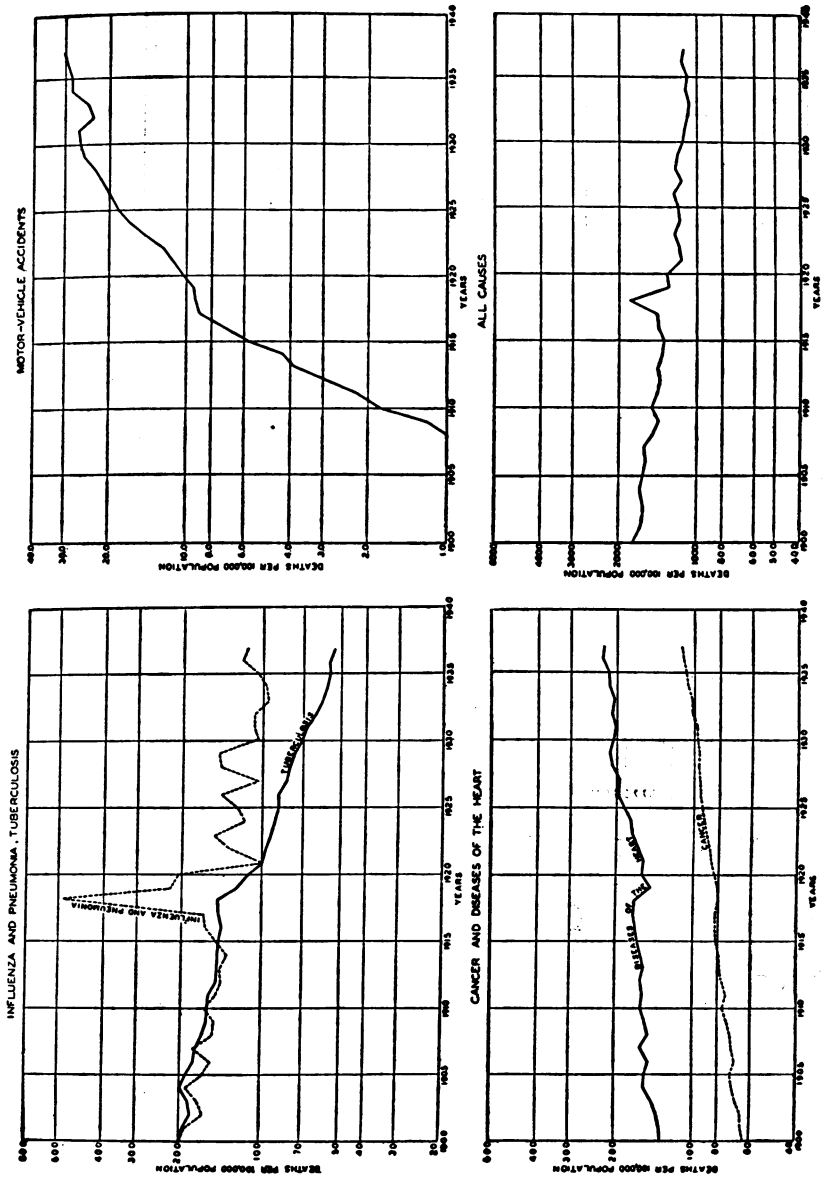


FIGURE 3.—Rate of increase or decrease of death rates for selected causes, United States registration area, 1900–1937.

death rate due to motor-vehicle accidents, although the graph representing the rate of increase in the last-named cause shows a flattening out since 1930.

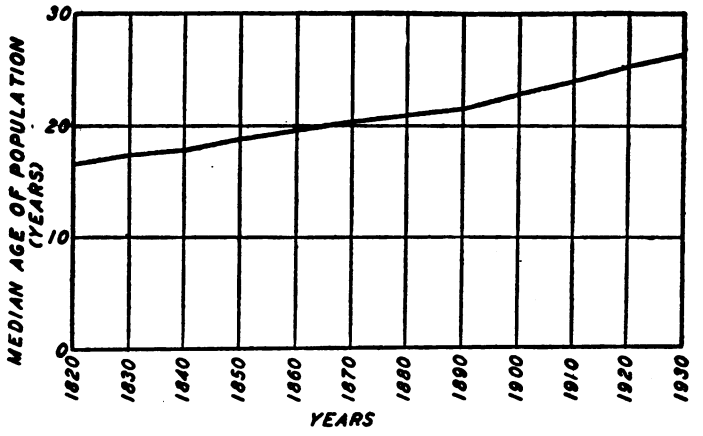


FIGURE 4.—Trend of median age of population, United States, 1820–1930.

As the Bureau of the Census states, "The marked reduction of mortality from the communicable diseases since 1900 has resulted largely from advances in sanitation, immunization, and medical treatment. The saving of life has occurred mainly among infants, children,

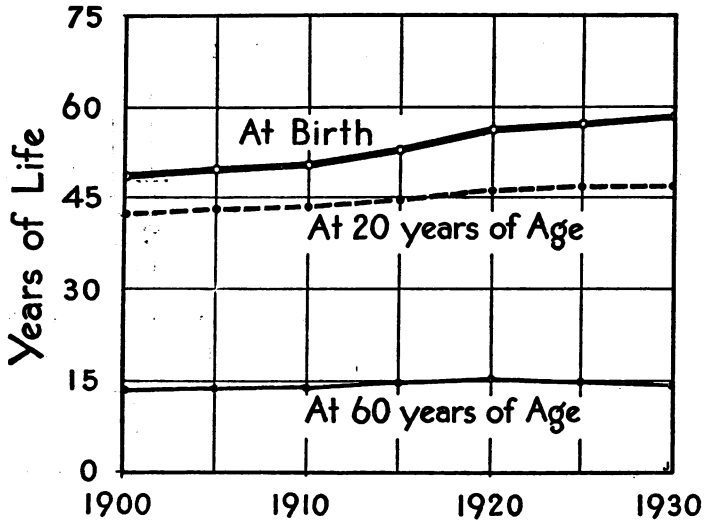


FIGURE 5.—Expectation of life of white males, 1900–1930 (original registration States used for 1900, 1910, and 1930; registration States of 1920 used for 1920).

and young adults. In contrast, the crude death rates for diseases of middle life have increased." This is no doubt due to the ageing of the population, to the larger proportion of persons in the older age groups, and to the fact that prevention and treatment of the degenerative

diseases have not progressed as rapidly as in the case of the communicable diseases. The increasing proportion of older persons is the result of a steadily declining birth rate, a saving of life in the earlier age groups, and the near cessation of immigration of young adults.

Figure 4 shows graphically the rise in the median age of the population from 1820 to 1930 and figure 5 shows the expectation of life of white males at birth, early adulthood, and at 60 years of age during the period 1900–1930. The greatest increase in life expectancy is that at birth, while the expectancy at age 60 remains about the same. The life expectancy for white females, which is higher than that for

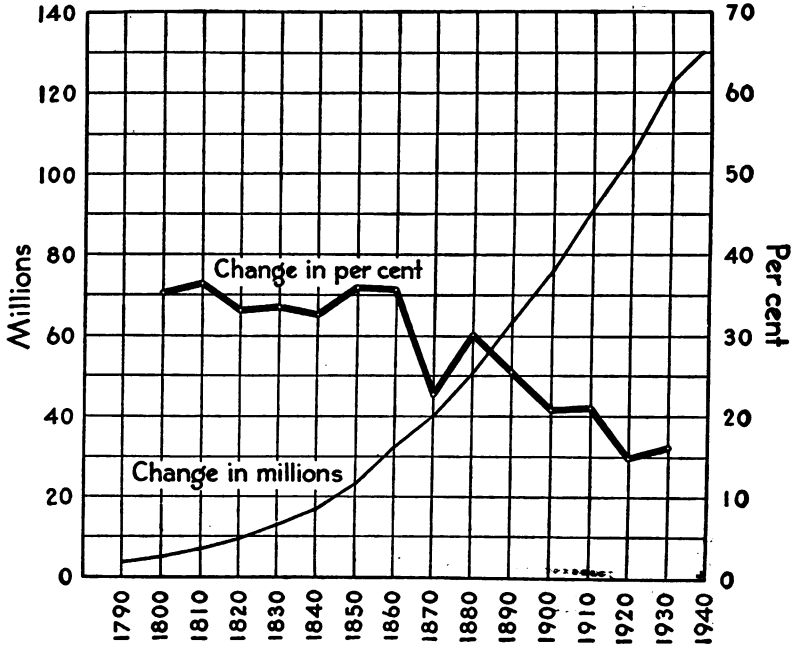


FIGURE 6.—Growth of population of the United States, 1790–1938.

males, follows closely a similar trend; and the expectancy for Negroes, while showing a similar increase, has remained considerably below that of white persons.

It may be expected that the proportion of the population in the older age periods will continue to increase, the present factors remaining constant, until a stabilized population has been reached.[3] The growth of the population will become slower, cease, and finally decline unless the birth rate increases significantly or a large-scale immigration occurs during the next few generations. Figure 6 shows

[3] Karpinos, Bernard D.: A stationary population. Human Biology, 7: 514–537 (December 1935).
Idem: The length of time required for the stabilization of a population. Am. J. Sociol., 41:504–513 (January 1936).
Idem: Stabilized method of forecasting population. Pub. Health Rep., 54:1807–1822 (1939).

the actual growth of the population of the United States from 1790 to 1938. The graph representing this growth, as plotted on an arithmetic chart, shows a continuous and regular increase, but if the data were presented on a semilogarithmic chart, representing the rate of increase, the curve would be almost horizontal up to 1860, when it would drop and start to slope downward, continuing that general trend up to the present time, with slight rises in the census years of 1880, 1910, and 1930. The percentage increase is represented by the heavy line in figure 6, which has been drawn in on the chart issued by the Bureau of the Census.

With the great reduction that has been made in most of the communicable diseases under the impact of public health effort, and with an increasing proportion of older persons in the population, the diseases of these older age groups have become major problems in medical and public health fields. The Public Health Service is turning its attention to their solution and is engaged in research with reference to the etiology and treatment of some of these diseases, especially heart disease and cancer. In addition, however, considerable expansion of diagnostic and hospital facilities may be needed to provide more nearly adequate specific therapy, X-ray, radium, and surgical treatments which are necessary in an effective attack on these diseases.

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## COURT DECISION ON PUBLIC HEALTH

*City authorized to require a license of wholesale soft drink business.*—(Illinois Supreme Court; *City of Chicago* v. *Chicago Beverage Co.*, 22 N.E.2d 708; decided June 19, 1939, rehearing denied October 4, 1939.) The Revised Chicago Code provided that no person or corporation should operate a wholesale food establishment without a license and defined "wholesale food establishment" as any building or establishment "used for the preparation, manufacture, canning, bottling, packing, distribution, selling, or offering or keeping for sale at wholesale, any article of food, confection, condiment, or drink used or intended for human consumption or any article which is the ingredient of or is used for or is mixed with or enters into the composition of any such food, confection, condiment or drink." A company engaged in the business of manufacturing, bottling, and selling, at wholesale, carbonated beverages or soft drinks was convicted of violating the said ordinance and on appeal the supreme court said that the question narrowed to whether sections 50 and 53 of article 5 of the cities and villages act conferred power on municipalities to regulate soft drinks. Section 50 gave municipalities power "To regulate the sale of meats, poultry, fish, butter, cheese, lard, vegetables, and all other provisions, and to provide for place and manner of selling the same and to control

the location thereof," while section 53 empowered municipalities "To provide for and regulate the inspection of meats, poultry, fish, butter, cheese, lard, vegetables, cotton, tobacco, flour, meal, and other provisions." The appellate court reviewed some of the prior cases involving the said sections and stated that "It will thus be seen that 'other provisions' and 'all other provisions' have been interpreted as broad and general terms, and to be the equivalent of 'food,' as defined in the pure food act of this State." The State pure food act defined "food" as "all articles used for food, drink, confectionery, or condiment by man or other animals, whether simple, mixed, or compound, and any substance used as a constituent in the manufacture thereof" and the court said that it could not be contended that this definition did not embrace soft drinks or carbonated beverages. The judgment of the lower court was affirmed, the supreme court holding that the above-mentioned sections 50 and 53 authorized the licensing of a wholesale soft drink business.

## DEATHS DURING WEEK ENDED OCTOBER 28, 1939

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

| | Week ended Oct. 28, 1939 | Corresponding week, 1938 |
|---|---|---|
| Data from 88 large cities of the United States: | | |
| Total deaths | 7,882 | 7,983 |
| Average for 3 prior years | [1] 8,001 | |
| Total deaths, first 43 weeks of year | 354,779 | 348,687 |
| Deaths under 1 year of age | 459 | 543 |
| Average for 3 prior years | [1] 521 | |
| Deaths under 1 year of age, first 43 weeks of year | 21,460 | 22,652 |
| Data from industrial insurance companies: | | |
| Policies in force | 66,574,186 | 68,282,548 |
| Number of death claims | 11,598 | 12,594 |
| Death claims per 1,000 policies in force, annual rate | 9.1 | 9.6 |
| Death claims per 1,000 policies, first 43 weeks of year, annual rate | 10.0 | 9.3 |

[1] Data for 86 cities.

# 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

## CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers.

In these and the following tables, a zero (0) indicates a positive report and has the same significance as any other figure, while leaders (...) represent no report, with the implication that cases or deaths may have occurred but were not reported to the State health officer.

*Cases of certain diseases reported by telegraph by State health officers for the week ended Nov. 4, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median*

| Division and State | Diphtheria | | | | Influenza | | | | Measles | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934–38, median | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934–38, median | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934–38, median |
| NEW ENG. | | | | | | | | | | | | |
| Maine | 0 | 0 | 2 | 1 | ... | ... | ... | ... | 42 | 7 | 30 | 30 |
| New Hampshire | 0 | 0 | 0 | 0 | ... | ... | ... | ... | 20 | 2 | 0 | 2 |
| Vermont | 0 | 0 | 0 | 0 | ... | ... | ... | ... | 416 | 31 | 8 | 8 |
| Massachusetts | 4 | 3 | 9 | 7 | ... | ... | ... | ... | 194 | 165 | 80 | 59 |
| Rhode Island | 0 | 0 | 1 | 1 | ... | ... | ... | ... | 321 | 42 | 0 | 2 |
| Connecticut | 6 | 2 | 2 | 4 | 12 | 4 | 2 | 2 | 21 | 7 | 37 | 37 |
| MID. ATL. | | | | | | | | | | | | |
| New York | 7 | 18 | 16 | 27 | [1] 2 | [1] 3 | [1] 10 | [1] 10 | 65 | 162 | 128 | 128 |
| New Jersey | 21 | 18 | 11 | 11 | 7 | 6 | 21 | 15 | 7 | 6 | 17 | 23 |
| Pennsylvania | 17 | 33 | 39 | 39 | ... | ... | ... | ... | 13 | 26 | 40 | 97 |
| E. NO. CEN. | | | | | | | | | | | | |
| Ohio | 33 | 43 | 57 | 57 | 5 | 7 | ... | 7 | 26 | 34 | 16 | 79 |
| Indiana | 49 | 33 | 31 | 42 | 10 | 7 | 16 | 28 | 15 | 10 | 4 | 10 |
| Illinois | 26 | 30 | 63 | 54 | 7 | 10 | 12 | 12 | 13 | 20 | 25 | 25 |
| Michigan [2] | 10 | 9 | 26 | 24 | 4 | 4 | ... | 1 | 75 | 71 | 59 | 36 |
| Wisconsin | 2 | 1 | 2 | 3 | 42 | 24 | 10 | 27 | 58 | 33 | 50 | 50 |
| W. NO. CEN. | | | | | | | | | | | | |
| Minnesota | 8 | 4 | 4 | 9 | 14 | 7 | 1 | ... | 54 | 28 | 98 | 16 |
| Iowa | 8 | 4 | 32 | 21 | ... | ... | 1 | 1 | 69 | 34 | 19 | 3 |
| Missouri | 17 | 13 | 23 | 39 | ... | ... | 19 | 39 | 6 | 5 | 13 | 13 |
| North Dakota | 7 | 1 | 7 | 2 | ... | ... | ... | ... | 7 | 1 | 201 | 3 |
| South Dakota | 0 | 0 | 3 | 3 | ... | ... | 2 | ... | 68 | 9 | 3 | 3 |
| Nebraska | 23 | 6 | 2 | 7 | 15 | 4 | 1 | 1 | 4 | 1 | 3 | 3 |
| Kansas | 17 | 6 | 8 | 12 | 6 | 2 | 3 | 1 | 106 | 38 | 4 | 4 |
| SO. ATL. | | | | | | | | | | | | |
| Delaware | 0 | 0 | 2 | 1 | ... | ... | ... | ... | 59 | 3 | 3 | 1 |
| Maryland [2] | 49 | 16 | 8 | 10 | 22 | 7 | 4 | 1 | 19 | 6 | 24 | 17 |
| Dist. of Col | 16 | 2 | 4 | 9 | ... | ... | 1 | ... | 0 | 0 | 0 | 3 |
| Virginia | 167 | 89 | 101 | 66 | 107 | 57 | 118 | ... | 7 | 4 | 44 | 38 |
| West Virginia | 56 | 21 | 27 | 47 | 51 | 19 | 10 | 10 | 11 | 4 | 14 | 14 |
| North Carolina [3] | 241 | 165 | 142 | 119 | 3 | 2 | 4 | 4 | 161 | 110 | 101 | 39 |
| South Carolina [3] | 76 | 28 | 32 | 30 | 819 | 300 | 294 | 192 | 3 | 1 | 4 | 4 |
| Georgia [3] | 76 | 46 | 44 | 44 | 58 | 35 | 20 | ... | 2 | 1 | 4 | 0 |
| Florida [3] | 33 | 11 | 20 | 19 | 6 | 2 | ... | ... | 42 | 14 | 40 | 1 |

See footnotes at end of table.

*Cases of certain diseases reported by telegraph by State health officers for the week ended Nov. 4, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median*—Continued

| Division and State | Diphtheria | | | | Influenza | | | | Measles | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934–38, median | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934–38, median | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934–38, median |
| E. SO. CEN. | | | | | | | | | | | | |
| Kentucky | 42 | 24 | 40 | 40 | 3 | 2 | 19 | 17 | 2 | 1 | 4 | 29 |
| Tennessee | 56 | 32 | 32 | 55 | 19 | 11 | 27 | 46 | 11 | 6 | 1 | 3 |
| Alabama [3] | 69 | 39 | 27 | 51 | 123 | 70 | 46 | 46 | 0 | 0 | 9 | 5 |
| Mississippi [3] | 35 | 14 | 31 | 21 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 0 |
| W. SO. CEN. | | | | | | | | | | | | |
| Arkansas | 47 | 19 | 37 | 25 | 127 | 51 | 48 | 26 | 5 | 2 | 4 | 2 |
| Louisiana [3] | 44 | 18 | 11 | 20 | 7 | 3 | 1 | 5 | 5 | 2 | 44 | 3 |
| Oklahoma | 44 | 22 | 30 | 16 | 66 | 33 | 76 | 40 | 2 | 1 | 15 | 2 |
| Texas [3] | 39 | 47 | 92 | 63 | 181 | 218 | 189 | 138 | 23 | 28 | 12 | 12 |
| MOUNTAIN | | | | | | | | | | | | |
| Montana | 0 | 0 | 1 | 1 | 159 | 17 | 9 | 3 | 637 | 68 | 152 | 13 |
| Idaho | 0 | 0 | 0 | 0 | ---- | ---- | 6 | 3 | 51 | 5 | 52 | 2 |
| Wyoming | 87 | 4 | 0 | 0 | 22 | 1 | ---- | ---- | 895 | 41 | 5 | 2 |
| Colorado | 34 | 7 | 10 | 8 | 63 | 13 | 3 | ---- | 101 | 21 | 5 | 5 |
| New Mexico | 0 | 0 | 10 | 5 | 12 | 1 | 1 | 1 | 25 | 2 | 14 | 14 |
| Arizona | 49 | 4 | 3 | 2 | 393 | 32 | 57 | 33 | 37 | 3 | 1 | 1 |
| Utah [3 4] | 20 | 2 | 0 | 0 | 20 | 2 | 2 | ---- | 119 | 12 | 10 | 13 |
| PACIFIC | | | | | | | | | | | | |
| Washington | 15 | 5 | 2 | 2 | ---- | ---- | ---- | ---- | 953 | 309 | 20 | 25 |
| Oregon | 0 | 0 | 2 | 2 | 75 | 15 | 12 | 22 | 119 | 24 | 9 | 9 |
| California [3] | 15 | 18 | 35 | 35 | 22 | 27 | 20 | 21 | 122 | 149 | 324 | 39 |
| Total | 34 | 857 | 1,081 | 1,085 | 47 | 996 | 1,065 | 846 | 63 | 1,549 | 1,750 | 1,750 |
| 44 weeks | 17 | 18,750 | 23,568 | 23,568 | 169 | 157,887 | 53,784 | 109,521 | 327 | 356,340 | 770,913 | 680,512 |

| Division and State | Meningitis, meningococcus | | | | Poliomyelitis | | | | Scarlet fever | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934–38, median | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934–38, median | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934–38, median |
| NEW ENG. | | | | | | | | | | | | |
| Maine | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 109 | 18 | 6 | 11 |
| New Hampshire | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 2 | 1 | 6 |
| Vermont | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 2 | 3 | 7 |
| Massachusetts | 0 | 0 | 0 | 1 | 2.4 | 2 | 1 | 2 | 81 | 69 | 78 | 121 |
| Rhode Island | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 4 | 6 | 12 |
| Connecticut | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 89 | 30 | 30 | 31 |
| MID. ATL. | | | | | | | | | | | | |
| New York | 0.8 | 2 | 5 | 5 | 9 | 23 | 3 | 6 | 54 | 134 | 178 | 241 |
| New Jersey | 1.2 | 1 | 0 | 1 | 5 | 4 | 0 | 1 | 71 | 60 | 52 | 61 |
| Pennsylvania | 2 | [4] | 1 | 3 | 7 | 13 | 6 | 6 | 146 | 288 | 216 | 298 |
| E. NO. CEN. | | | | | | | | | | | | |
| Ohio | 0 | 0 | 0 | 3 | 8 | 10 | 1 | 2 | 175 | 227 | 256 | 316 |
| Indiana | 3 | 2 | 2 | 1 | 7 | 5 | 0 | 2 | 192 | 129 | 99 | 152 |
| Illinois | 0 | 0 | 1 | 2 | 4 | 6 | 2 | 5 | 132 | 202 | 232 | 325 |
| Michigan [3] | 0 | 0 | 1 | 1 | 15 | 14 | 3 | 4 | 179 | 169 | 295 | 188 |
| Wisconsin | 0 | 0 | 0 | 1 | 5 | 3 | 1 | 3 | 220 | 125 | 140 | 163 |

See footnotes at end of table.

*Cases of certain diseases reported by telegraph by State health officers for the week ended Nov. 4, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median*—Continued

| Division and State | Meningitis, meningococcus | | | | Poliomyelitis | | | | Scarlet fever | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934–38, median | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934–38, median | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934–38, median |
| W. NO. CEN. | | | | | | | | | | | | |
| Minnesota | 1.9 | 1 | 1 | 0 | 29 | 15 | 0 | 1 | 132 | 68 | 72 | 95 |
| Iowa | 4 | 2 | 0 | 0 | 43 | 21 | 0 | 2 | 109 | 54 | 69 | 70 |
| Missouri | 0 | 0 | 2 | 2 | 1.3 | 1 | 0 | 2 | 90 | 70 | 117 | 113 |
| North Dakota | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 153 | 21 | 17 | 33 |
| South Dakota | 0 | 0 | 0 | 0 | 8 | 1 | 1 | 1 | 83 | 11 | 18 | 21 |
| Nebraska | 0 | 0 | 0 | 0 | 15 | 4 | 0 | 0 | 46 | 12 | 21 | 27 |
| Kansas | 2.8 | 1 | 0 | 0 | 6 | 2 | 0 | 2 | 179 | 64 | 126 | 99 |
| SO. ATL. | | | | | | | | | | | | |
| Delaware | 0 | 0 | 0 | 0 | 20 | 1 | 0 | 0 | 138 | 7 | 6 | 6 |
| Maryland [2] | 0 | 0 | 0 | 1 | 6 | 2 | 0 | 0 | 136 | 44 | 34 | 68 |
| Dist. of Col | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 81 | 10 | 8 | 10 |
| Virginia | 0 | 0 | 1 | 2 | 1.9 | 1 | 0 | 2 | 71 | 38 | 49 | 52 |
| West Virginia | 2.7 | 1 | 0 | 1 | 2.7 | 10 | 0 | 0 | 234 | 87 | 74 | 107 |
| North Carolina [2] | 0 | 0 | 2 | 3 | 0 | 0 | 1 | 1 | 140 | 96 | 88 | 85 |
| South Carolina [2] | 2.7 | 1 | 2 | 0 | 2.7 | 1 | 0 | 0 | 68 | 25 | 21 | 11 |
| Georgia [2] | 3 | 2 | 0 | 1 | 1.7 | 1 | 1 | 1 | 50 | 30 | 24 | 23 |
| Florida [2] | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 11 | 16 | 6 |
| E. SO. CEN. | | | | | | | | | | | | |
| Kentucky | 3 | 2 | 1 | 1 | 28 | 16 | 1 | 2 | 87 | 50 | 85 | 85 |
| Tennessee | 0 | 0 | 4 | 2 | 0 | 0 | 0 | 4 | 111 | 63 | 24 | 49 |
| Alabama [3] | 1.8 | 1 | 2 | 1 | 0 | 0 | 1 | 1 | 81 | 46 | 24 | 26 |
| Mississippi [2 3] | 2.5 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 23 | 9 | 21 | 19 |
| W. SO. CEN. | | | | | | | | | | | | |
| Arkansas | 0 | 0 | 0 | 1 | 5 | 2 | 0 | 1 | 35 | 14 | 32 | 18 |
| Louisiana [2] | 5 | 2 | 0 | 1 | 0 | 0 | 1 | 1 | 10 | 4 | 21 | 13 |
| Oklahoma | 0 | 0 | 1 | 1 | 0 | 0 | 3 | 2 | 46 | 23 | 32 | 22 |
| Texas [3] | 1.7 | 2 | 1 | 0 | 7 | 8 | 0 | 3 | 23 | 28 | 90 | 66 |
| MOUNTAIN | | | | | | | | | | | | |
| Montana | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 243 | 26 | 31 | 31 |
| Idaho | 0 | 0 | 0 | 0 | 10 | 1 | 0 | 0 | 102 | 10 | 4 | 24 |
| Wyoming | 0 | 0 | 0 | 0 | 22 | 1 | 0 | 0 | 327 | 15 | 6 | 9 |
| Colorado | 0 | 0 | 1 | 0 | 29 | 6 | 0 | 0 | 149 | 31 | 35 | 35 |
| New Mexico | 0 | 0 | 0 | 0 | 37 | 3 | 0 | 0 | 99 | 8 | 13 | 17 |
| Arizona | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 49 | 4 | 11 | 11 |
| Utah [2 4] | 10 | 1 | 0 | 0 | 50 | 5 | 0 | 1 | 189 | 19 | 13 | 27 |
| PACIFIC | | | | | | | | | | | | |
| Washington | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 1 | 117 | 38 | 25 | 40 |
| Oregon | 10 | 2 | 0 | 0 | 20 | 4 | 0 | 2 | 85 | 17 | 34 | 34 |
| California [3] | 0 | 0 | 2 | 2 | 16 | 20 | 1 | 11 | 121 | 147 | 149 | 149 |
| Total | 1.2 | 29 | 32 | 62 | 8 | 207 | 29 | 150 | 106 | 2,659 | 3,002 | 3,792 |
| 44 weeks | 1.5 | [5] 1,689 | 2,531 | 4,794 | 6 | 6,462 | 1,543 | 6,759 | 121 | 133,725 | 157,454 | 187,431 |

| Division and State | Smallpox | | | | Typhoid and paratyphoid fever | | | | Whooping cough | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934–38, median | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934–38, median | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases |
| NEW ENG. | | | | | | | | | | | |
| Maine | 0 | 0 | 0 | 0 | 18 | 3 | 1 | 2 | 133 | 22 | 34 |
| New Hampshire | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vermont | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 630 | 47 | 50 |
| Massachusetts | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 109 | 93 | 113 |
| Rhode Island | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 69 | 9 | 20 |
| Connecticut | 0 | 0 | 0 | 0 | 9 | 3 | 2 | 1 | 217 | 73 | 49 |

See footnotes at end of table.

*Cases of certain diseases reported by telegraph by State health officers for the week ended Nov. 4, 1939, rates per 100,000 population (annual basis), and comparison with corresponding week of 1938 and 5-year median*—Continued

| Division and State | Smallpox | | | | Typhoid and paratyphoid fever | | | | Whooping cough | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934-38, median | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases | 1934-38, median | Nov. 4, 1939, rate | Nov. 4, 1939, cases | Nov. 5, 1938, cases |
| **MID. ATL.** | | | | | | | | | | | |
| New York | 0 | 0 | 0 | 0 | 6 | 15 | 16 | 13 | 127 | 318 | 471 |
| New Jersey | 0 | 0 | 0 | 0 | 4 | 3 | 2 | 2 | 115 | 97 | 207 |
| Pennsylvania | 0 | 0 | 0 | 0 | 6 | 12 | 20 | 20 | 168 | 330 | 241 |
| **E. NO. CEN.** | | | | | | | | | | | |
| Ohio | 2 | 2 | 0 | 0 | 11 | 14 | 12 | 18 | 70 | 91 | 131 |
| Indiana | 4 | 3 | 4 | 4 | 6 | 4 | 5 | 5 | 39 | 26 | 13 |
| Illinois | 1 | 2 | 2 | 2 | 9 | 14 | 5 | 22 | 113 | 172 | 486 |
| Michigan [1] | 0 | 0 | 8 | 0 | 21 | 20 | 3 | 5 | 129 | 122 | 192 |
| Wisconsin | 0 | 0 | 3 | 6 | 0 | 0 | 0 | 1 | 207 | 118 | 374 |
| **W. NO. CEN.** | | | | | | | | | | | |
| Minnesota | 6 | 3 | 4 | 4 | 0 | 0 | 3 | 0 | 93 | 48 | 105 |
| Iowa | 16 | 8 | 3 | 7 | 0 | 0 | 7 | 1 | 32 | 16 | 20 |
| Missouri | 0 | 0 | 8 | 6 | 6 | 5 | 4 | 12 | 31 | 24 | 23 |
| North Dakota | 29 | 4 | 0 | 2 | 0 | 0 | 1 | 1 | 263 | 36 | 7 |
| South Dakota | 8 | 1 | 2 | 7 | 0 | 0 | 1 | 1 | 38 | 5 | 5 |
| Nebraska | 4 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 8 | 2 | 3 |
| Kansas | 3 | 1 | 1 | 1 | 8 | 3 | 2 | 2 | 17 | 6 | 25 |
| **SO. ATL.** | | | | | | | | | | | |
| Delaware | 0 | 0 | 0 | 0 | 20 | 1 | 1 | 2 | 138 | 7 | 12 |
| Maryland [2] | 0 | 0 | 0 | 0 | 15 | 5 | 12 | 8 | 96 | 31 | 37 |
| Dist. of Col | 0 | 0 | 0 | 0 | 8 | 1 | 2 | 0 | 121 | 15 | 10 |
| Virginia | 0 | 0 | 0 | 0 | 4 | 2 | 8 | 9 | 22 | 12 | 31 |
| West Virginia | 0 | 0 | 0 | 0 | 40 | 15 | 9 | 10 | 59 | 22 | 24 |
| North Carolina [3] | 0 | 0 | 0 | 0 | 7 | 5 | 7 | 8 | 99 | 68 | 221 |
| South Carolina [3] | 0 | 0 | 0 | 0 | 55 | 20 | 5 | 5 | 27 | 10 | 47 |
| Georgia [3] | 0 | 0 | 0 | 0 | 18 | 11 | 5 | 9 | 33 | 20 | 3 |
| Florida [3] | 0 | 0 | 0 | 0 | 12 | 4 | 0 | 1 | 36 | 12 | 0 |
| **E. SO. CEN.** | | | | | | | | | | | |
| Kentucky | 0 | 0 | 5 | 0 | 24 | 14 | 12 | 22 | 111 | 64 | 16 |
| Tennessee | 11 | 6 | 0 | 0 | 18 | 10 | 7 | 11 | 83 | 47 | 22 |
| Alabama [3] | 0 | 0 | 0 | 0 | 9 | 5 | 4 | 7 | 56 | 32 | 5 |
| Mississippi [2 3] | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 7 | ------ | ------ | ------ |
| **W. SO. CEN.** | | | | | | | | | | | |
| Arkansas | 10 | 4 | 2 | 1 | 22 | 9 | 4 | 9 | 15 | 6 | 21 |
| Louisiana [3] | 0 | 0 | 1 | 0 | 7 | 3 | 9 | 9 | 27 | 11 | 3 |
| Oklahoma | 10 | 5 | 3 | 2 | 18 | 9 | 13 | 14 | 0 | 0 | 45 |
| Texas [3] | 2 | 2 | 2 | 2 | 12 | 14 | 29 | 34 | 28 | 34 | 34 |
| **MOUNTAIN** | | | | | | | | | | | |
| Montana | 0 | 0 | 1 | 3 | 9 | 1 | 3 | 3 | 0 | 0 | 26 |
| Idaho | 10 | 1 | 0 | 0 | 20 | 2 | 3 | 2 | 10 | 1 | 1 |
| Wyoming | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 1 |
| Colorado | 29 | 6 | 2 | 0 | 14 | 3 | 0 | 5 | 39 | 8 | 25 |
| New Mexico | 0 | 0 | 1 | 0 | 25 | 2 | 12 | 12 | 445 | 36 | 15 |
| Arizona | 0 | 0 | 0 | 0 | 25 | 2 | 5 | 2 | 98 | 8 | 8 |
| Utah [2 4] | 0 | 0 | 0 | 0 | 30 | 3 | 0 | 0 | 576 | 58 | 13 |
| **PACIFIC** | | | | | | | | | | | |
| Washington | 0 | 0 | 2 | 6 | 3 | 1 | 7 | 4 | 15 | 5 | 50 |
| Oregon | 5 | 1 | 0 | 0 | 15 | 3 | 3 | 3 | 164 | 33 | 7 |
| California [2] | 4 | 5 | 2 | 0 | 15 | 18 | 15 | 7 | 73 | 89 | 138 |
| Total | 2 | 55 | 56 | 72 | 10 | 259 | 269 | 327 | 92 | 2,284 | 3,384 |
| 44 weeks | 8 | 8,965 | 3,192 | 6,490 | 10 | 11,530 | 12,940 | 13,609 | 140 | 152,382 | 179,650 |

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Typhus fever, week ended November 4, 1939; 71 cases as follows: North Carolina, 1; South Carolina, 5; Georgia, 29; Florida, 1; Alabama, 18; Mississippi, 1; Louisiana, 2; Texas, 11; California, 3.
[4] Rocky Mountain spotted fever, week ended November 4, 1939, Utah, 1 case.
[5] There were 3 cases of meningococcus meningitis in Pennsylvania during the week ended Sept. 23, instead of 4 as published in the Public Health Reports of Oct. 6, 1939, p. 1833. Diagnosis was changed in 1 case.

## SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

| State | Diphtheria | Influenza | Malaria | Measles | Meningitis, meningococcus | Pellagra | Poliomyelitis | Scarlet fever | Smallpox | Typhoid and paratyphoid fever |
|---|---|---|---|---|---|---|---|---|---|---|
| *September 1939* | | | | | | | | | | |
| Alaska | 0 | 20 | | 244 | 2 | | 0 | 0 | 0 | 1 |
| North Carolina | 368 | 2 | 60 | 30 | 4 | 7 | 20 | 238 | 1 | 36 |
| North Dakota | 6 | 33 | | 7 | 1 | | 3 | 50 | 2 | 7 |
| Rhode Island | 1 | | | 43 | 1 | | 1 | 6 | 0 | 1 |
| Utah | 0 | 4 | | 22 | 0 | | 20 | 33 | 0 | 1 |
| Virginia | 197 | 200 | 26 | 34 | 6 | 6 | 12 | 98 | 0 | 81 |
| *October 1939* | | | | | | | | | | |
| Connecticut | 3 | 2 | 1 | 29 | 1 | | 5 | 81 | 0 | 11 |
| Delaware | 2 | | | 1 | 0 | | 3 | 25 | 0 | 9 |
| Iowa | 36 | 1 | 13 | 29 | 4 | | 60 | 253 | 16 | 12 |
| Missouri | 46 | | 14 | 16 | 0 | | 3 | 206 | 1 | 45 |
| Wyoming | 4 | 2 | | 216 | 0 | | 3 | 17 | 2 | 4 |

*September 1939*

| | Cases |
|---|---|
| **Chickenpox:** | |
| North Carolina | 26 |
| North Dakota | 24 |
| Rhode Island | 11 |
| Utah | 47 |
| Virginia | 9 |
| **Dysentery:** | |
| Rhode Island (bacillary) | 21 |
| Virginia (bacillary) | 422 |
| **Encephalitis, epidemic or lethargic:** | |
| North Dakota | 1 |
| Virginia | 1 |
| **German measles:** | |
| North Carolina | 14 |
| North Dakota | 2 |
| Rhode Island | 2 |
| Utah | 7 |
| **Impetigo contagiosa:** | |
| Alaska | 3 |
| **Mumps:** | |
| North Dakota | 2 |
| Rhode Island | 14 |
| Utah | 58 |
| Virginia | 40 |
| **Rabies in animals:** | |
| Rhode Island | 3 |
| **Rocky Mountain spotted fever:** | |
| North Carolina | 5 |
| Virginia | 11 |
| **Scabies:** | |
| Alaska | 2 |
| **Septic sore throat:** | |
| North Carolina | 10 |
| Rhode Island | 8 |
| Virginia | 100 |
| **Tetanus:** | |
| Virginia | 2 |
| **Trachoma:** | |
| Utah | 3 |
| Virginia | 2 |

*September 1939*—Continued

| | Cases |
|---|---|
| **Tularaemia:** | |
| Utah | 5 |
| Virginia | 8 |
| **Typhus fever:** | |
| North Carolina | 9 |
| Virginia | 1 |
| **Undulant fever:** | |
| North Carolina | 3 |
| Rhode Island | 1 |
| Utah | 2 |
| Virginia | 3 |
| **Vincent's infection:** | |
| Alaska | 1 |
| North Dakota | 3 |
| **Whooping cough:** | |
| North Carolina | 338 |
| North Dakota | 89 |
| Rhode Island | 95 |
| Utah | 154 |
| Virginia | 127 |

*October 1939*

| | |
|---|---|
| **Chickenpox:** | |
| Connecticut | 117 |
| Delaware | 6 |
| Iowa | 152 |
| Missouri | 32 |
| Wyoming | 25 |
| **Dysentery:** | |
| Connecticut (bacillary) | 2 |
| Iowa (bacillary) | 2 |
| Missouri | 1 |
| **Encephalitis, epidemic or lethargic:** | |
| Connecticut | 2 |
| Iowa | 2 |
| Missouri | 4 |
| **German measles:** | |
| Connecticut | 7 |

*October 1939*—Continued

| | Cases |
|---|---|
| **Impetigo contagiosa:** | |
| Missouri | 5 |
| **Mumps:** | |
| Connecticut | 88 |
| Iowa | 85 |
| Missouri | 10 |
| Wyoming | 33 |
| **Rabies in animals:** | |
| Delaware | 3 |
| Iowa | 4 |
| Missouri | 1 |
| **Rocky Mountain spotted fever:** | |
| Wyoming (delayed reports) | 5 |
| **Septic sore throat:** | |
| Connecticut | 6 |
| Iowa | 17 |
| Missouri | 8 |
| **Tetanus:** | |
| Connecticut | 1 |
| Missouri | 1 |
| **Trachoma:** | |
| Missouri | 46 |
| **Tularaemia:** | |
| Iowa | 3 |
| Missouri | 3 |
| Wyoming | 2 |
| **Undulant fever:** | |
| Connecticut | 8 |
| Iowa | 12 |
| Wyoming | 4 |
| **Vincent's infection:** | |
| Wyoming | 1 |
| **Whooping cough:** | |
| Connecticut | 214 |
| Delaware | 11 |
| Iowa | 60 |
| Missouri | 64 |
| Wyoming | 10 |

## WEEKLY REPORTS FROM CITIES

*City reports for week ended October 28, 1939*

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table.

| State and city | Diphtheria cases | Influenza | | Measles cases | Pneumonia deaths | Scarlet fever cases | Smallpox cases | Tuberculosis deaths | Typhoid fever cases | Whooping cough cases | Deaths, all causes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cases | Deaths | | | | | | | | |
| Data for 90 cities: | | | | | | | | | | | |
| 5-year average | 218 | 93 | 30 | 335 | 471 | 889 | 6 | 338 | 45 | 912 | ---- |
| Current week | 130 | 85 | 29 | 279 | 341 | 545 | 0 | 314 | 30 | 737 | ---- |
| Maine: Portland | 1 | ---- | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 7 | 20 |
| New Hampshire: | | | | | | | | | | | |
| Concord | 0 | ---- | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 12 |
| Manchester | 0 | ---- | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 11 |
| Nashua | 0 | ---- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| Vermont: | | | | | | | | | | | |
| Barre | 0 | ---- | ---- | 0 | ---- | 0 | 0 | ---- | 0 | 0 | ---- |
| Burlington | 0 | ---- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 9 |
| Rutland | 0 | ---- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| Massachusetts: | | | | | | | | | | | |
| Boston | 3 | ---- | 3 | 6 | 15 | 5 | 0 | 5 | 0 | 17 | 185 |
| Fall River | 2 | ---- | 0 | 0 | 3 | 1 | 0 | 1 | 0 | 1 | 35 |
| Springfield | 0 | ---- | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 5 | 20 |
| Worcester | 1 | ---- | 0 | 0 | 9 | 2 | 0 | 0 | 0 | 3 | 39 |
| Rhode Island: | | | | | | | | | | | |
| Pawtucket | 0 | ---- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 15 |
| Providence | 1 | ---- | 0 | 18 | 5 | 2 | 0 | 1 | 0 | 23 | 79 |
| Connecticut: | | | | | | | | | | | |
| Bridgeport | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 30 |
| Hartford | 0 | ---- | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 20 | 37 |
| New Haven | 0 | ---- | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 2 | 53 |
| New York: | | | | | | | | | | | |
| Buffalo | 0 | ---- | 0 | 4 | 4 | 1 | 0 | 4 | 0 | 5 | 119 |
| New York | 16 | 8 | 3 | 13 | 40 | 49 | 0 | 64 | 5 | 89 | 1,385 |
| Rochester | 0 | ---- | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 2 | 59 |
| Syracuse | 0 | ---- | 0 | 0 | 2 | 2 | 0 | 1 | 0 | 16 | 44 |
| New Jersey: | | | | | | | | | | | |
| Camden | 0 | ---- | 0 | 0 | 0 | 12 | 0 | 1 | 0 | 0 | 23 |
| Newark | 0 | 2 | 0 | 0 | 3 | 3 | 0 | 5 | 0 | 19 | 94 |
| Trenton | 0 | ---- | 0 | 0 | 2 | 3 | 0 | 5 | 1 | 0 | 33 |
| Pennsylvania | | | | | | | | | | | |
| Philadelphia | 1 | 4 | 2 | 3 | 13 | 15 | 0 | 20 | 0 | 44 | 479 |
| Pittsburgh | 2 | 6 | 3 | 3 | 9 | 24 | 0 | 5 | 0 | 9 | 154 |
| Reading | 4 | ---- | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 6 | 13 |
| Scranton | 1 | ---- | 0 | 0 | ---- | 0 | 0 | ---- | 0 | 2 | ---- |
| Ohio: | | | | | | | | | | | |
| Cincinnati | 4 | ---- | 0 | 2 | 3 | 16 | 0 | 5 | 1 | 9 | 119 |
| Cleveland | 5 | 10 | 2 | 6 | 4 | 21 | 0 | 14 | 0 | 52 | 187 |
| Columbus | 5 | 2 | 2 | 2 | 6 | 3 | 0 | 4 | 0 | 0 | 95 |
| Toledo | 0 | ---- | 0 | 10 | 2 | 9 | 0 | 2 | 0 | 1 | 53 |
| Indiana: | | | | | | | | | | | |
| Anderson | 0 | ---- | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 14 |
| Fort Wayne | 0 | ---- | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 22 |
| Indianapolis | 1 | ---- | 0 | 1 | 5 | 15 | 0 | 6 | 1 | 6 | 95 |
| Muncie | 0 | ---- | 0 | 0 | 5 | 3 | 0 | 0 | 0 | 0 | 12 |
| South Bend | 0 | ---- | 0 | 0 | 1 | 4 | 0 | 1 | 0 | 0 | 13 |
| Terre Haute | 2 | ---- | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 20 |
| Illinois: | | | | | | | | | | | |
| Alton | 0 | ---- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| Chicago | 12 | 5 | 1 | 6 | 24 | 77 | 0 | 32 | 0 | 68 | 649 |
| Elgin | 0 | ---- | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 8 |
| Moline | 0 | ---- | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 7 |
| Springfield | 1 | ---- | 0 | 2 | 6 | 0 | 0 | 0 | 0 | 0 | 23 |
| Michigan: | | | | | | | | | | | |
| Detroit | 3 | 2 | 0 | 3 | 8 | 45 | 0 | 13 | 1 | 41 | 228 |
| Flint | 0 | ---- | 2 | 0 | 3 | 5 | 0 | 0 | 0 | 4 | 28 |
| Grand Rapids | 0 | ---- | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 3 | 33 |
| Wisconsin: | | | | | | | | | | | |
| Kenosha | 0 | ---- | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 2 | 10 |
| Madison | 0 | ---- | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 4 | 15 |
| Milwaukee | 0 | ---- | 0 | 1 | 10 | 22 | 0 | 4 | 0 | 17 | 79 |
| Racine | 0 | ---- | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 2 | 11 |
| Superior | 0 | ---- | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| Minnesota: | | | | | | | | | | | |
| Duluth | 0 | ---- | 0 | 1 | 0 | 3 | 0 | 1 | 0 | 1 | 20 |
| Minneapolis | 2 | ---- | 0 | 2 | 2 | 17 | 0 | 0 | 1 | 9 | 103 |
| St. Paul | 0 | ---- | 0 | 1 | 5 | 9 | 0 | 0 | 0 | 37 | 54 |

*City reports for week ended October 28, 1939*—Continued

| State and city | Diphtheria cases | Influenza | | Measles cases | Pneumonia deaths | Scarlet fever cases | Smallpox cases | Tuberculosis deaths | Typhoid fever cases | Whooping cough cases | Deaths, all causes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cases | Deaths | | | | | | | | |
| **Iowa:** | | | | | | | | | | | |
| Cedar Rapids | 0 | ------ | -------- | 0 | ------- | 0 | 0 | ------- | 0 | 0 | -------- |
| Davenport | 0 | ------ | -------- | 0 | ------- | 5 | 0 | ------- | 0 | 0 | -------- |
| Des Moines | 0 | ------ | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 39 |
| Sioux City | 1 | ------ | -------- | 0 | ------- | 8 | 0 | ------- | 0 | 2 | -------- |
| Waterloo | 3 | ------ | -------- | 0 | ------- | 3 | 0 | ------- | 0 | 0 | -------- |
| **Missouri:** | | | | | | | | | | | |
| Kansas City | 0 | ------ | 0 | 3 | 4 | 7 | 0 | 7 | 1 | 1 | 99 |
| St. Joseph | 1 | ------ | 0 | 0 | 6 | 4 | 0 | 0 | 0 | 0 | 28 |
| St. Louis | 4 | ------ | 0 | 1 | 13 | 12 | 0 | 8 | 1 | 17 | 242 |
| **North Dakota:** | | | | | | | | | | | |
| Fargo | 0 | ------ | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 7 |
| Grand Forks | 0 | ------ | -------- | 0 | ------- | 0 | 0 | ------- | 0 | 0 | -------- |
| Minot | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| **South Dakota:** | | | | | | | | | | | |
| Aberdeen | 0 | ------ | -------- | 0 | ------- | 2 | 0 | ------- | 0 | 0 | -------- |
| Sioux Falls | 0 | ------ | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 8 |
| **Nebraska:** | | | | | | | | | | | |
| Omaha | 0 | ------ | 0 | 0 | 6 | 3 | 0 | 1 | 0 | 0 | 45 |
| **Kansas:** | | | | | | | | | | | |
| Lawrence | 0 | ------ | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Topeka | 0 | ------ | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 12 |
| Wichita | 0 | ------ | 0 | 6 | 0 | 4 | 0 | 1 | 1 | 0 | 29 |
| **Delaware:** | | | | | | | | | | | |
| Wilmington | 0 | ------ | 0 | 1 | 0 | 3 | 0 | 0 | 1 | 4 | 25 |
| **Maryland:** | | | | | | | | | | | |
| Baltimore | 3 | 6 | 0 | 1 | 11 | 7 | 0 | 9 | 2 | 45 | 200 |
| Cumberland | 0 | ------ | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 10 |
| Frederick | 0 | ------ | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **Dist. of Col.:** | | | | | | | | | | | |
| Washington | 1 | ------ | 0 | 2 | 10 | 11 | 0 | 10 | 1 | 12 | 157 |
| **Virginia:** | | | | | | | | | | | |
| Lynchburg | 6 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 9 |
| Norfolk | 0 | 3 | 0 | 0 | 2 | 3 | 0 | 2 | 0 | 1 | 29 |
| Richmond | 1 | ------ | 1 | 1 | 2 | 3 | 0 | 3 | 0 | 1 | 51 |
| Roanoke | 2 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 9 |
| **West Virginia:** | | | | | | | | | | | |
| Charleston | 1 | ------ | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 11 |
| Huntington | 4 | ------ | -------- | 0 | ------- | 0 | 0 | ------- | 0 | 0 | -------- |
| Wheeling | 0 | ------ | 0 | 1 | 2 | 4 | 0 | 0 | 0 | 6 | 19 |
| **North Carolina:** | | | | | | | | | | | |
| Gastonia | 1 | ------ | -------- | 0 | ------- | 0 | 0 | ------- | 0 | 0 | -------- |
| Raleigh | 4 | ------ | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 21 |
| Wilmington | 2 | ------ | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 13 |
| Winston-Salem | 4 | ------ | 0 | 0 | 2 | 4 | 0 | 2 | 0 | 1 | 26 |
| **South Carolina:** | | | | | | | | | | | |
| Charleston | 1 | 14 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 24 |
| Florence | 3 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 13 |
| Greenville | 0 | ------ | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 17 |
| **Georgia:** | | | | | | | | | | | |
| Atlanta | 5 | 9 | 2 | 0 | 5 | 3 | 0 | 6 | 1 | 0 | 75 |
| Brunswick | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 5 |
| Savannah | 0 | 8 | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 0 | 31 |
| **Florida:** | | | | | | | | | | | |
| Miami | 0 | ------ | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 38 |
| Tampa | 1 | ------ | 0 | 0 | 4 | 1 | 0 | 1 | 0 | 1 | 23 |
| **Kentucky:** | | | | | | | | | | | |
| Ashland | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 4 |
| Covington | 0 | ------ | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 5 | 7 |
| Lexington | 0 | ------ | 0 | 0 | 0 | 2 | 0 | 2 | 1 | 0 | 18 |
| Louisville | 1 | ------ | 0 | 0 | 4 | 8 | 0 | 3 | 0 | 29 | 57 |
| **Tennessee:** | | | | | | | | | | | |
| Knoxville | 0 | ------ | 0 | 0 | 2 | 8 | 0 | 2 | 0 | 0 | 24 |
| Memphis | 0 | ------ | 2 | 0 | 7 | 5 | 0 | 5 | 0 | 11 | 72 |
| Nashville | 4 | ------ | 1 | 0 | 3 | 4 | 0 | 2 | 0 | 3 | 50 |
| **Alabama:** | | | | | | | | | | | |
| Birmingham | 2 | 3 | 0 | 1 | 3 | 4 | 0 | 3 | 1 | 0 | 83 |
| Mobile | 1 | ------ | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 14 |
| Montgomery | 2 | ------ | -------- | 0 | ------- | 0 | 0 | ------- | 0 | 4 | -------- |
| **Arkansas:** | | | | | | | | | | | |
| Fort Smith | 0 | ------ | -------- | 0 | ------- | 0 | 0 | ------- | 0 | 0 | -------- |
| Little Rock | 0 | ------ | 0 | 0 | 3 | 4 | 0 | 3 | 0 | 0 | -------- |
| **Louisiana:** | | | | | | | | | | | |
| Lake Charles | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 7 |
| New Orleans | 8 | ------ | 0 | 1 | 8 | 5 | 0 | 15 | 1 | 33 | 159 |
| Shreveport | 0 | ------ | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 35 |
| **Oklahoma:** | | | | | | | | | | | |
| Oklahoma City | 2 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 32 |
| Tulsa | 0 | ------ | -------- | 0 | ------- | 3 | 0 | ------- | 2 | 0 | -------- |

*City reports for week ended October 28, 1939*—Continued

| State and city | Diphtheria cases | Influenza | | Measles cases | Pneumonia deaths | Scarlet fever cases | Smallpox cases | Tuberculosis deaths | Typhoid fever cases | Whooping cough cases | Deaths, all causes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cases | Deaths | | | | | | | | |
| Texas: | | | | | | | | | | | |
| Dallas | 7 | ------ | 0 | 1 | 1 | 5 | 0 | 0 | 1 | 3 | 59 |
| Fort Worth | 0 | ------ | 0 | 0 | 2 | 2 | 0 | 1 | 0 | 1 | 30 |
| Galveston | 0 | ------ | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 22 |
| Houston | 1 | ------ | 0 | 0 | 6 | 3 | 0 | 5 | 0 | 1 | 90 |
| San Antonio | 1 | ------ | 0 | 2 | 3 | 0 | 0 | 4 | 0 | 1 | 45 |
| Montana: | | | | | | | | | | | |
| Billings | 0 | ------ | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 12 |
| Great Falls | 0 | ------ | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 8 |
| Helena | 0 | ------ | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 1 |
| Missoula | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Idaho: | | | | | | | | | | | |
| Boise | 0 | ------ | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 6 |
| Colorado: | | | | | | | | | | | |
| Colorado Springs | 0 | ------ | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 6 |
| Denver | 3 | ------ | 0 | 2 | 3 | 2 | 0 | 4 | 0 | 9 | 84 |
| Pueblo | 1 | ------ | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 15 |
| New Mexico: | | | | | | | | | | | |
| Albuquerque | 0 | ------ | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 20 |
| Utah: | | | | | | | | | | | |
| Salt Lake City | 0 | ------ | 0 | 2 | 0 | 3 | 0 | 1 | 0 | 28 | 37 |
| Washington: | | | | | | | | | | | |
| Seattle | 0 | ------ | 0 | 12 | 6 | 0 | 0 | 6 | 1 | 2 | 82 |
| Spokane | 0 | ------ | 0 | 2 | 0 | 10 | 0 | 0 | 0 | 2 | 24 |
| Tacoma | 0 | ------ | 0 | 142 | 1 | 2 | 0 | 1 | 0 | 0 | 28 |
| Oregon: | | | | | | | | | | | |
| Portland | 0 | 1 | 0 | 1 | 4 | 11 | 0 | 0 | 2 | 1 | 77 |
| Salem | 0 | ------ | -------- | 4 | ------- | 0 | 0 | ------- | 0 | 0 | -------- |
| California: | | | | | | | | | | | |
| Los Angeles | 0 | 4 | 0 | 9 | 8 | 24 | 0 | 11 | 1 | 16 | 234 |
| Sacramento | 0 | ------ | 0 | 1 | 4 | 1 | 0 | 0 | 1 | 0 | 23 |
| San Francisco | 0 | ------ | 0 | 3 | 5 | 0 | 0 | 5 | 0 | 7 | 165 |

| State and city | Meningitis, meningococcus | | Poliomyelitis cases | State and city | Meningitis, meningococcus | | Poliomyelitis cases |
|---|---|---|---|---|---|---|---|
| | Cases | Deaths | | | Cases | Deaths | |
| Massachusetts: | | | | North Dakota: | | | |
| Boston | 0 | 0 | 3 | Fargo | 0 | 0 | 1 |
| Fall River | 0 | 0 | 1 | South Dakota: | | | |
| New York: | | | | Aberdeen | 0 | 0 | 1 |
| Buffalo | 0 | 0 | 4 | Maryland: | | | |
| New York | 2 | 1 | 3 | Baltimore | 0 | 0 | 2 |
| Rochester | 0 | 0 | 2 | Virginia: | | | |
| Syracuse | 0 | 0 | 1 | Norfolk | 0 | 0 | 1 |
| Pennsylvania: | | | | Kentucky: | | | |
| Philadelphia | 0 | 0 | 5 | Covington | 0 | 0 | 1 |
| Scranton | 0 | 0 | 1 | Tennessee: | | | |
| Ohio: | | | | Memphis | 0 | 1 | 0 |
| Columbus | 0 | 0 | 1 | Louisiana: | | | |
| Illinois: | | | | Lake Charles | 1 | 0 | 0 |
| Chicago | 0 | 0 | 4 | New Orleans | 1 | 1 | 1 |
| Michigan: | | | | Texas: | | | |
| Detroit | 0 | 0 | 4 | Fort Worth | 0 | 0 | 1 |
| Flint | 1 | 0 | 0 | Houston | 0 | 1 | 1 |
| Wisconsin: | | | | Colorado: | | | |
| Milwaukee | 0 | 0 | 1 | Denver | 0 | 0 | 1 |
| Minnesota: | | | | Pueblo | 0 | 0 | 2 |
| Minneapolis | 0 | 0 | 7 | New Mexico: | | | |
| St. Paul | 1 | 0 | 1 | Albuquerque | 0 | 0 | 1 |
| Iowa: | | | | Oregon: | | | |
| Davenport | 1 | 0 | 0 | Portland | 0 | 0 | 1 |
| Des Moines | 1 | 0 | 9 | California: | | | |
| Missouri: | | | | Los Angeles | 0 | 0 | 1 |
| St. Louis | 0 | 0 | 1 | Sacramento | 0 | 0 | 3 |
| | | | | San Francisco | 0 | 0 | 6 |

*Encephalitis, epidemic or lethargic.*—Cases: Bridgeport, 1; Philadelphia, 2; Wichita, 1.
*Pellagra.*—Cases: Boston, 1; Charleston, S. C., 3; Florence, 1; Atlanta, 1; Miami, 2; Birmingham, 1; Little Rock, 1; New Orleans, 1; Dallas, 1; Los Angeles, 1.
*Typhus fever.*—Cases: New York, 1; Wilmington, N. C., 1; Savannah, 1; Tampa, 1; Mobile, 1; Houston, 3.

# FOREIGN REPORTS

## CANADA

*Provinces—Communicable diseases—Week ended October 21, 1939.*—During the week ended October 21, 1939, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

| Disease | Prince Edward Island | Nova Scotia | New Brunswick | Quebec | Ontario | Manitoba | Saskatchewan | Alberta | British Columbia | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Cerebrospinal meningitis | | | | 2 | | | | 1 | | 3 |
| Chickenpox | | 17 | | 144 | 182 | 34 | 37 | 13 | 63 | 490 |
| Diphtheria | | | 5 | 62 | 4 | 5 | 9 | 2 | | 87 |
| Dysentery | | | | 7 | | | | | 5 | 12 |
| Influenza | | 62 | | | 2 | 1 | | | | 65 |
| Lethargic encephalitis | | | | 1 | | | | | | 1 |
| Measles | | 2 | | 161 | 86 | 11 | 1 | | 39 | 300 |
| Mumps | | | | 25 | 35 | 8 | 8 | 1 | 7 | 84 |
| Pneumonia | 1 | 5 | | | 12 | | | | 8 | 26 |
| Poliomyelitis | | | | | 2 | 1 | | | | 3 |
| Scarlet fever | | 10 | 1 | 67 | 135 | 19 | 8 | 16 | 21 | 277 |
| Trachoma | | | | | | 18 | | | | 18 |
| Tuberculosis | 5 | 9 | 4 | 68 | 48 | 5 | | | | 139 |
| Typhoid and paratyphoid fever | | | 1 | 47 | 2 | 1 | 4 | 2 | 1 | 58 |
| Whooping cough | | 26 | | 128 | 71 | 38 | 69 | 27 | 23 | 382 |

## PANAMA CANAL ZONE

*Notifiable diseases—July–September 1939.*—During the months of July, August, and September 1939, certain notifiable diseases, including imported cases, were reported in the Panama Canal Zone and terminal cities as follows:

| Disease | July | | August | | September | |
|---|---|---|---|---|---|---|
| | Cases | Deaths | Cases | Deaths | Cases | Deaths |
| Chickenpox | 4 | | 7 | | 3 | |
| Diphtheria | 9 | | 5 | | 8 | |
| Dysentery (amoebic) | 9 | | 8 | 1 | 9 | 2 |
| Dysentery (bacillary) | 5 | 5 | 1 | 1 | 4 | |
| Leprosy | 1 | | 1 | | | |
| Malaria | 110 | 2 | 96 | 3 | 85 | 3 |
| Measles | 1 | | | | | |
| Meningococcus meningitis | | | 1 | 1 | | |
| Mumps | 2 | | | | 2 | |
| Paratyphoid fever | 1 | | | | | |
| Pneumonia | | 21 | | 24 | | 8 |
| Relapsing fever | 1 | | | | | |
| Scarlet fever | | | 2 | | | |
| Tuberculosis | | 33 | | 27 | | 42 |
| Typhoid fever | 4 | | 3 | 1 | 2 | |
| Typhus fever | | | | | 1 | |

## SWEDEN

*Notifiable diseases—September 1939.*—During the month of September 1939, cases of certain notifiable diseases were reported in Sweden as follows:

| Disease | Cases | Disease | Cases |
|---|---|---|---|
| Cerebrospinal meningitis | 5 | Poliomyelitis | 124 |
| Diphtheria | 20 | Scarlet fever | 1,934 |
| Dysentery | 15 | Syphilis | 27 |
| Epidemic encephalitis | 10 | Typhoid fever | 12 |
| Gonorrhea | 1,261 | Undulant fever | 10 |
| Paratyphoid fever | 106 | Weil's disease | 4 |

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

NOTE.—A cumulative table giving current information regarding the world prevalence of quarantinable diseases for a six-month period appeared in the PUBLIC HEALTH REPORTS of October 27, 1939, pages 1950–1963. A similar cumulative table will appear in future issues of the PUBLIC HEALTH REPORTS for the last Friday of each month.

### Cholera

*China—Tientsin.*—During the week ended August 5, 1939, 1 case of cholera was reported in Tientsin, China.

*Japan—Osaka.*—During the week ended October 14, 1939, 1 imported case of cholera was reported in Osaka, Japan.

### Plague

*Argentina—Salta Province—Colon.*—During the period October 16–31, 1939, 1 fatal case of bubonic plague was reported in Colon, Salta Province, Argentina.

### Smallpox

*Colombia.*—During the month of August 1939, smallpox was reported in Argentina, by Departments, as follows: Antioquia, 18 cases, 1 death; Caldas, 52 cases, 1 death; Cundinamarca, 3 cases; Huila, 9 cases; North Santander, 2 cases, 1 death; Santander, 15 cases; Tolima, 13 cases; Valle, 48 cases; Villavicencio, 1 case.

### Yellow Fever

*Colombia—Antioquia Department.*—During the month of August 1939, 1 case of yellow fever with 1 death was reported in Antioquia Department, Colombia.

*Ivory Coast—Abengourou.*—On October 29, 1939, 1 suspected case of yellow fever was reported in Abengourou, Ivory Coast.

*Senegal—Dakar.*—On October 30, 1939, 1 suspected case of yellow fever said to have been imported from Tivaouane was reported in Dakar, Senegal.

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