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THE PRESENT STATUS OF STREPTOCOCCUS BIOLOGIC PRODUCTS IN THE PREVENTION AND TREATMENT OF SCARLET FEVER[1]

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The use of scarlet-fever streptococcus toxin and scarlet-fever streptococcus antitoxin for the prevention and treatment of scarlet fever was discussed before this conference in 1926. It was the opinion of the members taking part in the discussion that—

1. The intradermal reaction to scarlet-fever streptococcus toxin is a fairly dependable measure of the susceptibility of the individual tested.
2. The majority of the individuals giving a positive reaction can be effectively immunized by the proper use of scarlet-fever streptococcus toxin.
3. The use of scarlet-fever streptococcus antitoxin, either for passive immunization or for the treatment of the individual ill with scarlet fever, is not yet founded on sufficient clinical data to permit a mature opinion as to the efficacy of this form of treatment.

The results of a vast amount of research work have been reported on since the 1926 conference, yet there seems to be little reason to alter the opinions just mentioned. No new and definite work which has direct application to the problems confronting the health officer has appeared. The accumulated data, however, have served to crystallize our opinions and to clarify the atmosphere somewhat.

Kirkbride and Wheeler (1) have isolated potent toxin-producing hemolytic streptococci from patients as late as six months after the onset of the disease. These toxins were neutralized by anti-streptococcus goat serum which had been produced with the Dochez NY–5 strain of streptococcus. Tunnicliff and Crooks (2) report on a hospital outbreak of scarlet fever. They feel that 14 cases of scarlet fever were derived from 3 healthy persons from whom hemolytic streptococci were isolated, the opsonic index method being used for the identification of the organisms. Moriwaki (3) found healthy carriers of hemolytic streptococci in 11 households in which there were

[1] Presented at the Twenty-eighth Annual Conference of State and Territorial Health Officers with the United States Public Health Service, Washington, D. C., June 18, 1930 (held jointly with the Forty-fifth Annual Conference of State and Provincial Health Authorities of North America).

cases of scarlet fever. In 10 instances the indications were that the scarlet-fever cases resulted from contact with healthy carriers. The findings of these and many other workers indicate that hemolytic streptococci may be isolated from the throats of persons ill with scarlet fever, from persons who have recently recovered from an attack of scarlet fever, from healthy persons who have had contact with those known to harbor the organism, and often from the throats of persons whose history gives no indication of association with scarlet fever. However, the mere isolation of a hemolytic streptococcus is not proof positive of its relationship to scarlet fever. The hemolytic streptococcus group is a very large one. The specificity and constancy of its individual members have not been fully established. In fact, the limits of specificity of the hemolytic streptococcus associated with scarlet fever are uncertain. A heated controversy is raging on this very subject. Equally good workers are to be found on either side of the question. The discovery of a hemolytic streptococcus in the throat of a well person can not be used to any practical or workable advantage by the health officer until these more or less academic controversies have been settled, and until there is made available to the diagnostic laboratory a method of identification which is both sure and relatively simple in its technique.

The subcutaneous injection into Dick-positive individuals of sufficient quantities of scarlet-fever streptococcus toxin will change the skin reaction from positive to negative in a very large percentage of those injected. Most workers report that 90 to 100 per cent of the reacting individuals will change from positive to negative. What influence such treatment has on the prevalence of scarlet fever in a large community can not be stated with certainty at the present time. The writer is not aware that it has been tried anywhere in this country so as to include a sufficiently large and representative population. Toyoda (4) and his colleagues, working in the city of Dairen, Manchuria, have recently presented some very interesting statistics. With regard to the prevalence of scarlet fever for the period of their reported observations the authors state that "within this span of time the worst epidemic of scarlet fever yet known about Dairen occurred." The prophylactic immunization of all of the Japanese primary-school children was completed in 1927. The scarlet-fever morbidity rates among the Japanese citizens of Dairen, the primary-school children excluded, were as follows:

Year	Population	Cases of scarlet fever	Attack rate per 1,000
1925	69,962	191	2.73
1926	71,122	629	8.85
1927	73,353	317	4.33
1928	77,455	262	3.38

At the same time the rates for the Japanese primary-school children were:

Year	Primary-school population	Cases of scarlet fever	Attack rate per 1,000
1925	8,623	100	11.6
1926	8,971	152	16.9
1927	9,788	114	11.6
1928	10,489	41	3.9

The data indicate that scarlet fever was equally prevalent during each of the four years; yet in 1928, the first year following complete immunization of the primary-school population, the morbidity rate in this latter group fell to 3.9 as compared to rates of over 10 per 1,000 for each of the three preceding years. The same authors quote Ozaki of the South Manchuria Railway Co., who is reporting on the Japanese primary-school children living under the jurisdiction of the railway company. Ozaki reports as follows:

Grouping of children according to skin reactions	Number in each group	Attack rate per 1,000
Not Dick tested and not immunized	1,849	23.8
Dick tested; found negative and not immunized	1,495	1.3
Dick tested; found positive but not immunized	47	106.4
Dick tested; found positive and completely immunized	1,112	2.6

Kiefer (5) and others have reported on the disappearance of scarlet fever from institutions in which there has been active immunization of those inmates showing a positive Dick test. While the presumption is strong that such immunization did eliminate institutional scarlet fever, yet the small number of individuals usually involved and the low prevalence in the community at large leave some possibility for the play of chance. The Dicks (6) report no cases of scarlet fever among 1,191 susceptible nurses and internes who had been immunized before they began work in hospitals for patients with contagious diseases. As a control they report 37 cases of scarlet fever among an unstated number of nurses and internes, who entered before they had been tested for susceptibility or who were known to have positive skin reactions and had not been immunized.

Interesting as these very recent statistics on the use of scarlet-fever streptococcus toxin are, yet they present nothing fundamentally new. Let us now consider a few facts known as early as 1905 and 1906, and even suspected as early as 1884. In 1906 Gabrichevsky, director of the Bacteriological Institute at the Moscow University, published (7) his method for preparing scarlatina vaccine by taking the organism direct from one sick with scarlatina and growing it in

bouillon. Gabrichevsky's vaccine combined our present sterile toxin with the killed organism. Small injections of this product into an individual produced no symptoms, whereas the injection of a large dose produced symptoms which are identical with the symptoms produced by the disease itself. Identical results are obtained to-day by the use of the sterile toxin produced according to the Dick method. Gabrichevsky states: "* * * All these symptoms are characteristic of scarlatina, and therefore the application of the vaccine gives a new, very important, argument in favor of the specificity of the scarlatina streptococcus and its toxin, as really it is to the latter, more than anything else, we have to ascribe these attacks."

Beginning in October, 1905, Langovoy (8) began observations on the action of Gabrichevsky's scarlatina vaccine at the St. Vladimir Hospital in Moscow, which work was performed upon the suggestion of Gabrichevsky. Langovoy reports 4 cases among 309 unvaccinated patients and 1 case among 120 vaccinated, but this 1 case developed before the immunization had been completed. Nikitin (9), at the request of Gabrichevsky, began using the latter's vaccine in the Zvenigorod district in January, 1906. At that time an epidemic of scarlet fever was raging, with a mortality of 20 per cent among those infected. The attack rate among the unvaccinated was 16 per cent, whereas among the vaccinated it was only 1.4 per cent, and this latter among those who had received only one injection.

Additional evidence could be presented. Agreement is fairly general that scarlet-fever streptococcus toxin has found a definite field of usefulness in the active immunization of persons susceptible to scarlet fever. However, agreement has not been reached as to the number of injections or the total dose of toxin required for the production of immunity. Enough must be given to produce a high percentage of immunes, but at the same time it must not be forgotten that reactions do occur. The reactions are not serious from the standpoint of endangering life, and therefore might be overlooked in institutional work, but they do become of great importance in private practice.

The time has not yet arrived for the proper evaluation of scarlet-fever streptococcus antitoxin in the treatment of scarlet fever. Numerous papers on this subject have appeared in medical literature. Although Toomey (10) found 125 such references listed in the Quarterly Cumulative Index up to June, 1928, he was unable, from the combined data therein contained, to form an opinion of the value of such antitoxin. The difficulty is that such clinical demonstrations are rarely controlled in the rigid manner required of scientific experiments. Eley (11), from his studies at the Willard Parker Hospital, concludes that scarlet-fever streptococcus antitoxin is of definite

value, but that mild and moderately sick patients do not receive enough benefit to warrant its use, because the reaction to the serum is more severe than the disease itself. Various clinicians, who are from experience qualified to form an opinion, have stated to the writer that it is their belief that a really potent scarlet-fever streptococcus antiserum is of benefit in the treatment of selected cases. We still are in need of a very closely controlled clinical demonstration of the therapeutic value of such antiserum.

In spite of the very considerable amount of work which has been done on the use of these new products in the prophylaxis and treatment of scarlet fever, there are certain shortcomings which need correction before the health officer can afford to push their use very energetically. Until we can correct these defects, their use by the practicing physician will remain very limited, and the public at large will not accept them to any great extent. I refer particularly to the present practice of using five injections of toxin, low in potency, relatively high in protein content, and which causes annoying reactions in a fairly large per cent of those treated. In order to attain general acceptance and usage, we must have a product which will require fewer doses and cause less reaction.

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ACUTE RESPONSE OF GUINEA PIGS TO VAPORS OF SOME NEW COMMERCIAL ORGANIC COMPOUNDS

IV.—ETHYLENE OXIDE[1]

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This report on the acute response of guinea pigs to ethylene oxide gas is the fourth of a series of similar reports which deal with studies pertinent to evaluating the hazards involved in exposure to some chemical products which have recently reached, or promise to reach, important domestic and industrial use. The first report of the series dealt with ethylene dichloride vapors,[3] the second with ethyl benzene vapor,[4] and the third with "Cellosolve" (ethylene glycol monoethyl ether).[5]

The investigation was undertaken at the request of the Carbide & Carbon Chemicals Corporation and was conducted jointly with the United States Bureau of Mines at its experiment station at Pittsburgh, Pa.

USE OF ETHYLENE OXIDE

Ethylene oxide is principally used as an intermediate in the synthesis of other compounds as methyl, ethyl, and butyl Cellosolve. It is also a promising fumigant, for use either alone[6] or mixed with carbon dioxide for stimulating the respiration of insects.[7] A fumigant containing 1 part ethylene oxide and 8 parts carbon dioxide is being marketed at the present time under the trade name "Carboxide."

SCOPE OF WORK

The scope of the work included a study of the toxicity of ethylene oxide and the physiological response to its vapors as determined by the exposure of guinea pigs. Only acute effects as produced by a single exposure were studied. The experiments were planned to give

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[1] This report represents work done under a cooperative agreement between the Bureau of Mines, Department of Commerce, and the Carbide & Carbon Chemicals Corporation. Published by permission of the Director, U. S. Bureau of Mines.

[2] Assistant surgeon, U. S. Public Health Service, detailed to the Bureau of Mines.

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information relative to the concentrations and periods of exposure which produce but slight response, moderate response, and serious response.

DESCRIPTION OF MATERIAL USED FOR TESTS

Ethylene oxide (CH_2CH_2O) is a colorless gas at ordinary room temperatures (boiling point 10.7° C.). It possesses a mild, sweetish odor and is readily soluble in water. The specific gravity is 0.887 at 7°/4° C. Its inflammability limits are 3 to 80 per cent by volume in air.[8]

The ethylene oxide used in the experiments described in this report was a plant product of 99.5 per cent purity as determined by specific gravity measurements. The volatile chlorides were less than 0.01

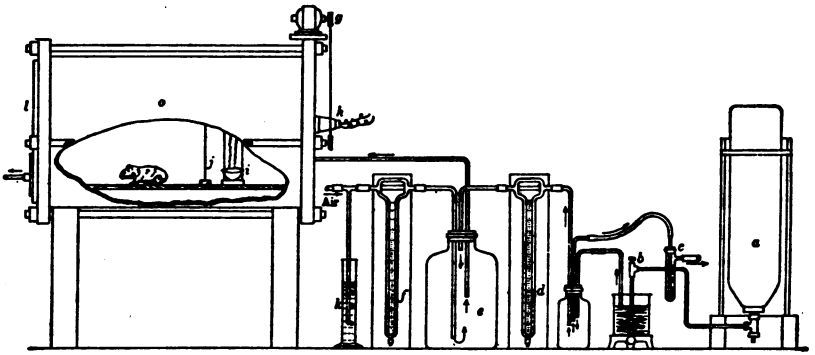

FIGURE 1.—Apparatus for preparing ethylene oxide-air mixtures which were near to or within the inflammable range

per cent as chlorine and the residue was less than 0.3 per cent by volume.

TEST APPARATUS

The apparatus used to prepare ethylene oxide air mixtures near to or within the inflammable range is shown in Figure 1. This apparatus differs from the one previously described in the report dealing with response to ethylene dichloride vapor, only in the method of preparing the gas-air mixtures. As ethylene oxide is a gas at room temperatures and is confined in steel cylinders under pressure, and ethylene dichloride is a liquid at room temperatures, the necessity for changing the method is obvious.

Referring to Figure 1, ethylene oxide confined as a liquid under pressure in steel container *a*, is released through the container valve and a needle valve *b* for regulating the flow, to a vaporizer consisting of a coil of copper tubing immersed in an electrically-heated water-bath. The vapors pass through a calibrated flowmeter *d* and are

[8] Jones, G. W.: U. S. Bureau of Mines, unpublished data.

mixed in *e* with a measured quantity of air from flowmeter *f*. The resultant mixture enters the chamber *o* and finally escapes through the outlet at the opposite end of *o*. The amount of air that passes through *f* is always equal to or greater than sufficient to effect three air changes per hour in *o*. Pressure regulators *k* and *c* maintain the pressure; consequently, they maintain a constant flow through the respective flowmeters after they are adjusted to give the desired gas-air mixture. Changes in gas concentrations are usually made by changing the height of the column of water in regulator *c*, and consequently the flow through *d*. The rate of vaporization of the liquid is regulated by needle valve *b* until there is a small but positive escape of excess vapor through the waste gas outlet of *c*.

The reason for vaporizing liquid material obtained from the inverted cylinder *a* was to assure that the vapor composition would be the same as the liquid composition. That condition could not be assumed when taking internally vaporized material from the vapor space of the cylinder in an upright position, because traces of impurities whose partial pressures were proportionately greater than their molar concentrations might be present.

As many of the vapor-air mixtures used for making exposures were within the inflammable range, a significant explosion hazard was obviously presented by the large volume of the mixture necessary for this type of work. Accordingly, to protect the persons engaged in the work, chamber *o* was constructed of steel capable of withstanding the force of an explosion. The chamber was also provided with a parchment relief diaphragm. The construction of the chamber has has been described in detail in a previous report.[3]

Ethylene oxide-air mixtures whose composition was within the safe range from the viewpoint of explosion hazards were prepared in the gas chamber shown in Figures 2 and 3. With the exception of the apparatus for preparing the gas-air mixtures this chamber was also the same as that previously described.[3]

The apparatus and method for preparing ethylene oxide-air mixtures in this large chamber (figs. 2 and 3) are much the same as for the small chamber *o* (fig. 1), except that the gas and air enter the chamber separately and are mixed inside the chamber rather than in an external reservoir as used with the apparatus shown in Figure 1.

COMPUTATION AND ANALYSIS OF GAS-AIR MIXTURES

The composition of the ethylene oxide-air mixtures were computed according to the formula $pv=RT$. As the gas is very soluble in water, the flowmeters were calibrated with air and the flow for ethylene

[3] See footnote 3

oxide was computed on the basis of the viscosities or rates of flow being inversely proportional to the square roots of the densities of air and ethylene oxide, respectively. Although this is not considered to be an extremely accurate procedure, nevertheless the results

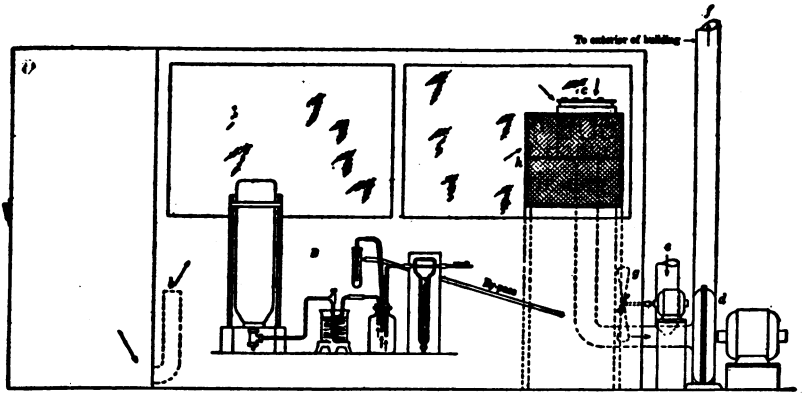

FIGURE 2.—Apparatus for making exposure to noninflammable ethylene oxide-air mixtures (side elevation plan)

given later in Table 1 substantiate its suitability for the purpose at hand.

The gas-air mixtures were created by adjusting the flowmeters of the vaporizing apparatus to give an atmosphere having the desired

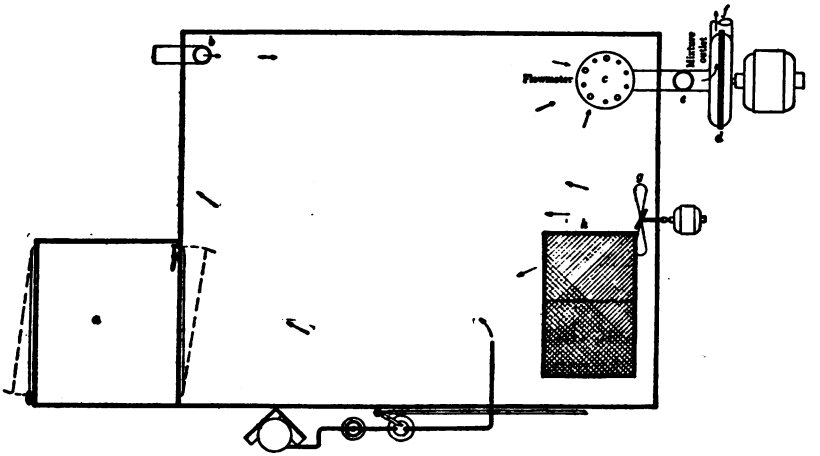

FIGURE 3.—Apparatus for making exposure to noninflammable ethylene oxide-air mixtures (horizontal plan)

proportions of gas and air. The composition of the atmosphere was then checked by analysis.

As ethylene oxide is readily soluble in water, ordinary gas volumetric methods of analysis in which the gas comes in contact with even traces of water or aqueous solutions can not be used. The method

employed in the investigation described in this report consisted of passing the gas-air mixture through a measured amount of 2–N HCl (in a Milligan or other efficient type of gas-scrubbing bottle) and subsequently determining the excess acid by titrating the whole or an aliquot part (well cooled) with standardized saturated barium hydroxide solution using methyl orange indicator. The ethylene oxide and hydrochloric acid react to form chlorhydrin. Sodium and potassium hydroxide were found to be unsatisfactory for determining the excess acid. It is presumed that they caused hydrolysis of the chlorhydrin, even when the solution was cooled.

The volume of gas-air mixture used for making a determination was measured by passing the effluent air from the absorption bottle through a gas meter (gas-calorimeter type). The volume of air indicated by the meter plus the amount of ethylene oxide found in the scrubbing bottle was taken as the total gas-air volume, and the proportion of ethylene oxide in the air was calculated on that basis.

The chemical method for ethylene oxide was occasionally checked by absorption with air-equilibrated charcoal and determining the gain in weight. Agreement of the results of analysis is shown in Table 1.

TABLE 1.—*Analysis of ethylene oxide-air mixtures, per cent by volume*

Expected from calculation	Found by titration method	Found by charcoal absorption
1.4	1.4	1.3
.7	.8	.7
.7	.6	----------

TEST PROCEDURE, DESCRIPTION, AND CARE OF ANIMALS

The test procedure and description and care of animals were the same as described in a previously published report dealing with ethylene dichloride.[3]

RESULTS OF TESTS

The detailed test data are too voluminous to be presented in this report and only summarized results pertinent to symptoms, gross pathology, and fatality are given here. Specimens of tissue were taken for microscopic examination, a report of which will be made later.

SYMPTOMS

Control animals.—No symptoms were exhibited by the 24 control guinea pigs used in these tests, and no deaths occurred.

Exposed animals.—Table 2 gives the symptoms shown by the animals exposed to vapors of ethylene oxide, also the average period

[3] See footnote 3.

of exposure necessary to produce these symptoms by various concentrations of vapor in air. When viewing the table the reader should note that the figures in parentheses indicate that the particular symptom did not occur in the maximum period of test as given.

Nasal irritation shown by the guinea pigs scratching at the nose was an early and constant symptom in all the pigs except those exposed to 0.025 per cent ethylene oxide in air. The time of onset and the severity of the irritation was directly dependent on the concentration of the vapors.

TABLE 2.—*Symptoms produced in guinea pigs during exposure to vapors of ethylene oxide*

Type of symptom	Concentration of vapor and period of exposure causing symptoms [1]									
	8.5	6.3 to 6.4	5.1	4	1.4 to 2.5	0.7	0.3	0.13	0.06	0.025
Nasal irritation; scratching at nose	[2]	[2]	[2]	[2]	[2]	4	30	30	30–60	[3](480)
Eye irritation; squinting and lacrimation	1–2	1–2	1–2	2–4	4–8	4–7	30	30	60–120	[3](480)
Blood tinged, frothy serous exudate from nostrils	[3](37)	[3](20)	[3](5)	[3](20)	60	150	330	[4]	[3](480)	[3](480)
Unsteadiness on feet, staggering	9	9–11	[4]	[3](20)	45	[4]	[4]	[4]	[3](480)	[3](480)
Animals on sides; unable to stand; quiet	12–18	17	[3](5)	[3](20)	50–107	150	[4]	[4]	[3](480)	[3](480)
Respiratory cycle first affected; increase in rate and amplitude, usually slowed in rate at first in high concentrations	13	17	[3](5)	[4]	[4]	35	[4]	[3](480)	[3](480)	[3](480)
Dyspnea progressing to gasping accompanied by use of accessory muscles and raising of head	30	[3](20)	[3](5)	20	50–90	45–80	330	[3](480)	[3](480)	[3](480)

[1] Concentration of vapor in per cent by volume; time in minutes.
[2] Occurs immediately after being put on test.
[3] Not observed during maximum period of exposure as given in parentheses.
[4] Not determined.

Profuse lacrimation, blinking, and squinting of the eyes were also constant symptoms, except in the lowest concentration used, 0.025 per cent. These symptoms also apparently varied in severity directly with the concentration. Examination of the eyes of the animals immediately after removal from the exposure chamber showed a distinct reddening of the conjunctiva and prominence of the vessels of the sclera at either canthus of the eye. The irritation was evidently dependent on direct exposure and had no after-effects, as examination of the eyes of those pigs that survived 24 hours after exposure was negative.

A frothy, blood-tinged, serous exudate effused from the nostrils at the end of exposure to 2.5 per cent ethylene oxide for 1 hour, 1.4 per cent for 1 and 2 hours, 0.7 per cent for 2½ hours, and 0.3 per cent for 6 hours.

Exposure to 8.5, 6.3, and 6.4 per cent ethylene oxide in air caused the animals to become unsteady on their feet and stagger on attempt-

ing to move about within 10 minutes, and at the end of 15 minutes to fall on their sides, in which condition they remained until the end of the exposures or until death occurred. Pigs exposed to 1.4 per cent were unsteady within 45 minutes and fell to their sides within 50 to 107 minutes; exposure to 0.7 per cent caused the animals to fall on their sides in 150 minutes.

The respirations were apparently increased in rate and amplitude at the end of 8 hours' exposure to 0.13, 0.06, and 0.025 per cent. The first effect of higher concentrations, 8.5, 6.4, and 0.7 per cent was to increase the depth or amplitude and slow the rate of respirations within 13, 17, and 35 minutes, respectively.

Dyspnea, progressing to gasping, with employment of accessory muscles of respiration and the lifting of the head, was observed after 30 minutes' exposure to 8.5 per cent and after 20, 50–90, 45–80, and 330 minutes' exposure to 4.0. 1.4, 0.7, and 0.3 per cent, respectively.

Exposure to 0.025 per cent for 8 hours did not produce any of the foregoing symptoms described.

DISCUSSION OF SYMPTOMS

Ethylene oxide is apparently extremely irritating to the eyes. Signs of such irritation were exhibited by all exposed pigs except those subjected to the lowest concentration, 0.025 per cent. This irritation apparently produces no permanent lesion, and disappears after removal from the atmosphere containing the vapors.

The remaining symptoms exhibited by the pigs may be ascribed to the irritative effect of the gas on the respiratory system. The changes in the respirations are those which might be expected from a respiratory irritant, likewise the unsteadiness and falling to the sides, which is probably explainable on the basis of insufficient oxygenation resulting from constriction and obstruction of the air passages.

Irritation of the upper respiratory passages as shown by the presence of a thin, serous, frothy, blood-tinged exudate about and in the nostrils did not occur in the highest concentrations of the vapors. This is probably due to insufficient time for its occurrence. Exposures to the lowest concentrations (0.13 and 0.025 per cent) for long periods (8 hours) likewise did not produce this symptom. All of the animals that showed this exudation from the nostrils died on test as in the case of exposure to 0.7 per cent for 2½ hours, or within 4 hours after removal from exposure.

GROSS PATHOLOGY

Control animals.—A total of 24 control animals were killed for autopsy. The animals were taken from the same stock and selected in the same manner as the groups of animals used for exposure to ethylene oxide-air mixtures.

Exposed animals.—Examination of the pigs that died during exposure (see fig. 4 for conditions of exposure causing death on test) revealed a large amount of lacrimal secretion collected on the fur about the eyes. The conjunctiva was reddened. The nostrils were

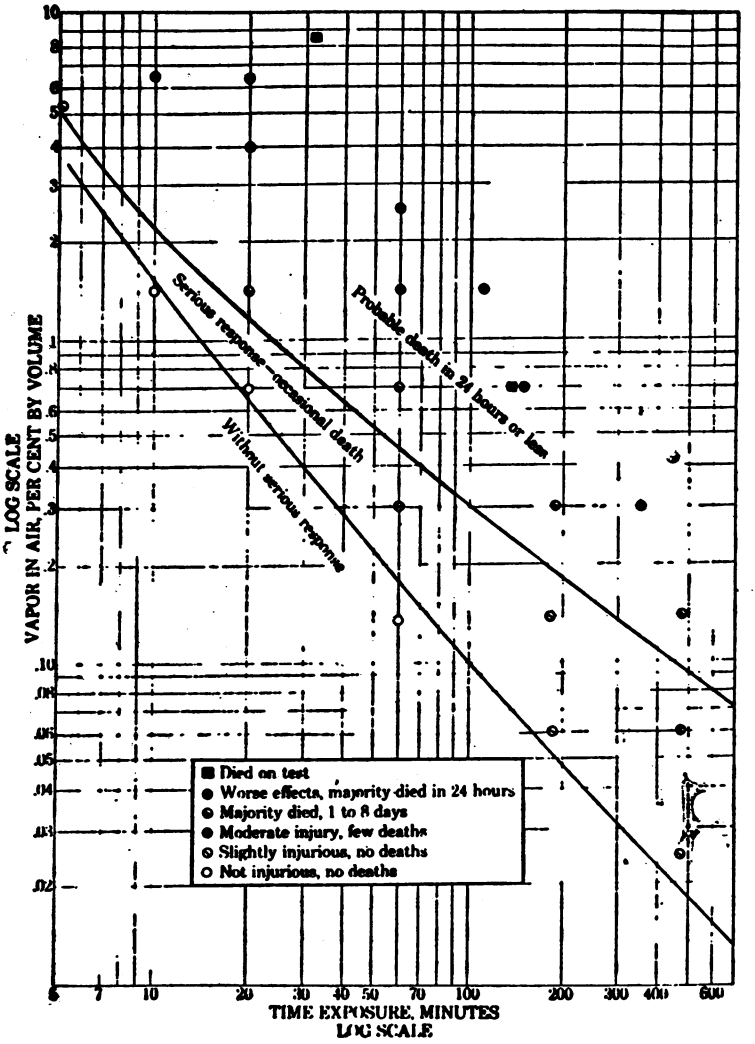

FIGURE 4.—Acute effects of exposure of guinea pigs to ethylene oxide vapor in air

filled with a thin, frothy, serous exudate. The mucous membrane of the mouth was pale and cyanotic.

Examination of the internal viscera revealed a large amount of congestion and edema of the lungs. The trachea and bronchi contained a frothy, serous, exudate, and their mucous membrane was reddened. Cut section of the lungs was moist, deep red in color, and bled freely. There were irregular-shaped areas of deeper red

mottling throughout. Pressure expressed a large amount of frothy, bloody fluid from the bronchioles and air sacs. The liver was deep red to purple in color and welled blood on cutting. The surface vessels of the pancreas were prominent. The kidneys were tense to palpation and deep red to purple in color. Cut section bled freely.

The findings in pigs which were exposed to conditions that caused death to majority of the animals in less than 24 hours following exposure were the same as the above—that is, acute congestion and edema of the lungs with a hyperemia of the liver and kidneys. All of these animals (represented by filled circles in fig. 4) died within 3½ hours after removal from test.

Animals killed for autopsy immediately after exposure to conditions that caused death to the majority within 1 to 8 days (represented in fig. 4 by half-filled circles) were practically negative for gross changes, except some evidence of congestion of the lungs noted in two instances (exposures to 0.3 per cent for 3 hours and 0.13 per cent for 8 hours). The pigs that died in 1 to 6 days after exposures showed characteristic changes in the lungs common to all. The lungs were voluminous and did not collapse on opening the chest. They were deep pink to red in color, mottled with numerous dark red or reddish brown areas of irregular shape and size. These areas were separated by portions of lung tissues light in color. On cut sections the areas were firm, noncrepitant and presented a moist, red, granular surface. In one instance the upper lobes of both lungs were consolidated, being dark red in color, firm to touch and noncrepitant. In another instance, areas of red and gray hepatization were found scattered throughout the cut section of one lobe.

In addition to the changes in the lungs noted above, if the animals did not die until after the second day there were evident changes in the kidneys. The kidneys were pale and boggy to palpation. The cut section was also pale, with a yellowish discoloration and a thickening of the cortex. The 2 pigs which were killed 3 and 4 days after exposure (exceptions noted previously) exhibited the same changes.

Exposure to conditions that did not cause death or serious injury (represented in fig. 4 by halved circles) produced a slight congestion of the lungs as noted in the animals killed immediately after exposure. In animals killed four days following exposure, there were slight changes in the kidneys similar in type to those previously described. Eight days following exposure the findings were negative.

A slate gray discoloration of the liver was noted in those pigs that were exposed to 1.4 per cent vapors for 1 and 2 hours.

DISCUSSION OF PATHOLOGICAL FINDINGS

The gross pathological changes in the respiratory system of guinea pigs exposed to ethylene oxide gas are similar to those produced by

the inhalation of irritating gases, such as chlorine. The acute irritation to the air passages and lungs is the most prominent picture presented by the animals that died during exposure or within a few hours following exposure. Animals that died in 1 to 6 days after exposure show an added infective process involving the lungs resulting in the occurrence of lobar and lobular pneumonia, chiefly the latter. The occurrence of the changes resembling pneumonic processes are apparently increased in frequency with the time of delay of death. In these instances—that is, deaths occurring 2 to 6 days after exposure—there is also evidence of parenchymatous changes in the kidneys.

SUMMARY OF FATALITY AND PHYSIOLOGICAL RESPONSE

A summary of the fatality and response of guinea pigs exposed to various concentrations of ethylene oxide in air is shown graphically in Figure 4 and given in four conventional degrees of response in Table 3. In Figure 4 the results of each experiment are designated by a symbol which represents one of six different degrees of severity. The selected symbol describes the results obtained for at least one-half the individual animals and in most cases the results for the majority or all of the group (at least three and usually six animals) exposed to a given condition.

The following are the six degrees of response in Figure 4:

1. Died on test.
2. Majority died within 24 hours.
3. Majority died, 1 to 8 days.
4. Moderate injury, few deaths.
5. Slightly injurious, no deaths.
6. Not injurious, no deaths.

In addition to representing the response of each group by symbols, the latter have been separated into three general fields or zones of probable response; namely,

1. Probable death, 24 hours or less.
2. Serious response, occasional death.
3. Without serious response.

Table 3 gives the concentration of ethylene oxide in air that produces the four degrees of response usually reported in the literature dealing with noxious gases. These data may be compared with toxicological data for other compounds. [3] [4] [5] [9] [10] [11] [12]

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[3] [4] See previous footnotes.

[9] Sayers, R. R., Yant, W. P., Thomas, B. G. H., and Berger, L. B.: Physiological response attending exposure to vapors of methyl bromide, methyl chloride, ethyl bromide, and ethyl chloride. Pub. Health Bull. No. 185, 1929.

[10] International Critical Tables, first edition, 1927, vol. 2, p. 318. Also see errata sheet, vol. 2.

[11] Henderson, Yandell, and Haggard, Howard W.: Noxious Gases. American Chemical Society Monograph No. 35, 1927, Chemical Catalog Co., New York.

[12] Fieldner, A. C., Katz, S. H., and Kinney, S. P.: Gas masks for gases met in fighting fires. U. S. Bureau of Mines Tech. Paper 248, 1921.

TABLE 3.—*Acute effects of exposure of guinea pigs to ethylene oxide in air, concentration in per cent by volume*

Kills in a very short time	5 to 10
Dangerous in 30 to 60 minutes	0.3 to 0.6
Maximum amount for 60 minutes without serious disturbances	0.3
Slight symptoms after several hours or maximum amount without serious disturbances	0.025

RELATION OF SYMPTOMS TO FATALITY FOLLOWING EXPOSURE

There appeared to be a direct relation between the severity of the symptoms of irritation of the respiratory system and death. All animals that showed an exudate from the nostrils died within the 24 hours following exposure.

GENERAL DISCUSSION OF HEALTH HAZARDS AND WARNING PROPERTIES

A comparison with the toxicological data reported for other compounds [3] [4] [5] [9] [10] [11] [12] indicates that from the standpoint of concentrations in air causing harm, ethylene oxide is less harmful to breathe than other common irritating gases, such as hydrogen chloride or sulphur dioxide, but it is a good deal more harmful than carbon tetrachloride and chloroform. In general, its harmful concentrations are similar to ammonia.

The hazard to health is mainly due to low concentrations which persons may endure for a period long enough to cause marked irritation of the respiratory system. Although ethylene oxide does not possess a distinct odor to give warning of its presence in these low concentrations, it is fortunately an irritant and in that manner gives warning.

ACKNOWLEDGMENTS

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SUMMARY AND CONCLUSIONS

The acute physiological response of guinea pigs to air containing ethylene oxide was determined. The concentration of vapor and periods of exposure ranged from those which produced death to those which caused no apparent effect after several hours' exposure. The symptoms, gross pathology, and fatality are given, with a discussion of the potential health hazards.

[3] [4] [5] [9] [10] [11] [12] See previous footnotes.

1. In the order of occurrence the symptoms produced are nasal irritation, eye irritation, blood-tinged, frothy, serous exudate from nostrils, unsteadiness on feet and staggering, inability to stand, respiratory disturbances, dyspnea and gasping, and death. Most of these symptoms occurred with exposures to concentrations of 8.5 to 0.3 per cent by volume. Eye and nose irritation were the principal symptoms with exposure to 0.13 and 0.06 per cent; no distinct symptoms were observed with exposure to 0.025 per cent.

2. The principal gross pathological change was marked irritation of the respiratory system. This was most prominent in animals that died within a few hours following exposure. Lobar and lobular pneumonia and parenchymatous changes in the kidneys were noted in the animals that died 2 to 6 days following exposure.

3. Exposure to 5 to 10 per cent causes death after a few minutes exposure; 0.3 to 0.6 per cent for 30 to 60 minutes is dangerous to the life of guinea pigs; 0.3 per cent is the maximum for 60 minutes without serious disturbances; and 0.025 per cent is the maximum allowable concentration for several hours without serious disturbances.

4. From the standpoint of relative toxicity (concentrations causing acute harm) ethylene oxide is less harmful than hydrogen chloride and sulphur dioxide, more harmful than chloroform and carbon tetrachloride, and similar to ammonia.

5. Ethylene oxide does not possess enough odor to give distinct warning of harmful concentrations, but it causes intolerable irritation to the eyes and nose when present in high concentrations, and moderate though distinct irritation in comparatively safe concentrations. This irritation must, however, be taken as warning of a dangerous atmosphere to avoid serious injury.

COURT DECISION RELATING TO PUBLIC HEALTH

Disposal of sewage by city into tidal waters held not to be a nuisance and injunction refused.—(Maryland Court of Appeals; Cityco Realty Co. *v.* Mayor, Counselor, and Aldermen of City of Annapolis, 150 A. 273; decided May 15, 1930.) The city of Annapolis discharged, and had done so for many years, untreated sewage into adjacent tidal waters. The waters were heavily polluted, and the State legislature had taken note of this condition in legislation enacted by it. The plaintiff company, which owned some land bounding in part on the polluted waters, sought to enjoin the city from discharging sewage into the tidal waters, it being contended that the polluted condition of the waters made their property, intended for subdivision into building lots, practically unsalable. The conditions complained of had

existed long before the company bought the land in question. The trial court dismissed the bill and the company appealed. The court of appeals stated that, assuming that a public nuisance which injuriously and specially affected private rights could be enjoined, the questions presented were (1) whether the acts complained of constituted a nuisance, and (2) whether, if they did, they should be restrained under the circumstances of the case. It was said that the rule, recognized wherever the question had arisen in the courts of this country or England, was that the discharge by a municipality, acting in the exercise of power conferred by the State, of sewage into tidal waters was not a nuisance. The court said, however, that the rule did not protect a municipality where, through negligence or a wanton disregard of public or private rights, it does in fact create a nuisance or actually invades private property. Proceeding, the court then stated that "as there is no evidence of any negligence or misconduct in this case, it follows that the acts complained of do not constitute a nuisance if done under the authority of the State."

The substance of certain statutes was then given and regarding these it was said:

> Construing these statutes together, they are sufficient to authorize the State department of health, in the exercise of a power validly delegated to it by the legislature, to assent, on the part of the State, to the discharge of sewage into Spa Creek. And since it appears that since 1914 the State department of health has expressly authorized the construction of new sewers which discharge their effluent into those waters, and as the sewage from the Statehouse and other State property is and for a long time has been discharged through these sewers into the same waters, it may be reasonably presumed that the State has not only expressly assented to that use of Spa Creek by the appellee since 1914, but it may also be inferred that it ratified the acts of the appellee in constructing, prior to 1914, sewers discharging into it. Our conclusion, therefore, is that the acts of which appellant complains do not constitute a nuisance, that it is not entitled to the relief prayed, and that its bill was properly dismissed. It follows that the decree appealed from will be affirmed.

DEATHS DURING WEEK ENDED JULY 26, 1930

Summary of information received by telegraph from industrial insurance companies for the week ended July 26, 1930, and corresponding week of 1929. (From the Weekly Health Index July 31, 1930, issued by the Bureau of the Census, Department of Commerce)

	Week ended July 26, 1930	Corresponding week, 1929
Policies in force	76, 003, 866	74, 539, 596
Number of death claims	14, 064	12, 239
Death claims per 1,000 policies in force, annual rate	9. 6	8. 6

Deaths from all causes in certain large cities of the United States during the week ended July 26, 1930, infant mortality, annual death rate, and comparison with corresponding week of 1929. (From the Weekly Health Index, July 31, 1930, issued by the Bureau of the Census, Department of Commerce)

City	Week ended July 26, 1930		Annual death rate per 1,000 corresponding week, 1929	Deaths under 1 year		Infant mortality rate, week ended July 26, 1930 [3]
	Total deaths	Death rate [1]		Week ended July 26, 1930	Corresponding week 1929	
Total (65 cities)	7, 205	12. 6	10. 8	728	586	[3] 64
Akron	59			10	4	91
Albany [4]	32	13. 9	13. 9	2	5	44
Atlanta	89	18. 2	18. 6	15	10	159
White	42			9	5	286
Colored	47	(5)	(5)	6	5	95
Baltimore [4]	286	18. 0	11. 9	26	15	88
White	209			16	9	69
Colored	77	(5)	(5)	10	6	162
Birmingham	64	15. 0	13. 8	12	2	112
White	26			4	2	62
Colored	38	(5)	(5)	8	0	189
Boston	187	12. 2	11. 2	23	10	65
Bridgeport	28			1	2	17
Buffalo	124	11. 6	9. 2	12	7	53
Cambridge	12	5. 0	10. 8	2	2	37
Camden	41	15. 8	13. 5	10	3	181
Canton	19	8 5	6. 2	1	1	25
Chicago [4]	637	10. 5	10. 3	42	51	37
Cincinnati	161			18	10	107
Cleveland	196	10. 1	8. 9	19	16	57
Columbus	97	16. 9	10. 5	9	7	88
Dallas	55	13. 2	12. 7	10	7	
White	40			5	6	
Colored	15	(5)	(5)	5	1	
Dayton	44	12. 4	10. 7	4	2	59
Denver	70	12. 4	11. 7	7	8	73
Des Moines	28	9. 6	9. 6	2	3	35
Detroit	250	9. 5	9. 0	37	32	57
Duluth	25	11. 2	9. 4	4	0	108
El Paso	34	15. 0	11. 5	7	6	
Erie	29			2	1	43
Fall River [4]	27	10. 5	8. 9	3	3	69
Flint	16	5. 6	8. 8	4	3	47
Fort Worth	32	9. 8	10. 7	1	6	
White	29			1	5	
Colored	3	(5)	(5)	0	1	
Grand Rapids	27	8. 6	12. 4	2	7	30
Houston	52			8	5	
White	30			4	5	
Colored	22	(5)	(5)	4	0	
Indianapolis	91	12. 4	12. 0	9	7	67
White	76			7	6	61
Colored	15	(5)	(5)	2	1	108
Jersey City	65	10. 4	11. 4	9	8	78
Kansas City, Kans	29	12. 8	17. 6	1	3	24
White	23			1	3	27
Colored	6	(5)	(5)	0	0	0
Kansas City, Mo	116	15. 5	11. 9	13	6	101
Knoxville	25	12. 4	9. 9	7	3	164
White	20			5	3	130
Colored	5	(5)	(5)	2	0	494

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended July 26, 1930, infant mortality, annual death rate, and comparison with corresponding week of 1929. (From the Weekly Health Index, July 31, 1930, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended July 26, 1930		Annual death rate per 1,000 corresponding week, 1929	Deaths under 1 year		Infant mortality rate, week ended July 26, 1930 [2]
	Total deaths	Death rate [1]		Week ended July 26, 1930	Corresponding week 1929	
Los Angeles	209			24	13	73
Louisville	76	12.0	12.7	8	10	70
White	52			7	10	69
Colored	24	(5)	(5)	1	0	72
Lowell	23			0	4	0
Lynn	22	10.9	5.9	3	1	76
Memphis	63	17.3	17.5	10	9	119
White	32			7	6	129
Colored	31	(5)	(5)	3	3	101
Milwaukee	92	8.8	8.9	7	9	35
Minneapolis	71	8.1	10.8	5	3	32
Nashville	53	19.8	16.4	8	6	124
White	26			5	5	103
Colored	27	(5)	(5)	3	1	190
New Bedford	25			1	1	26
New Haven	32	8.9	10.0	5	0	97
New Orleans	121	14.7	16.8	21	17	122
White	66			11	8	97
Colored	55	(5)	(5)	10	9	168
New York	1,541	13.4	10.1	152	119	64
Bronx borough	223	12.2	8.5	16	12	38
Brooklyn borough	515	11.6	8.0	65	32	69
Manhattan borough	597	17.8	14.6	56	60	92
Queens borough	157	9.6	7.9	13	13	38
Richmond borough	49	17.0	12.5	2	2	37
Newark, N. J	79	8.7	9.4	7	12	37
Oakland	54	10.3	10.3	5	3	60
Oklahoma City	49			9	3	177
Omaha	72	16.9	13.8	6	7	68
Paterson	23	8.3	7.9	1	1	17
Philadelphia	559	14.1	9.4	62	29	92
Pittsburgh	161	12.5	12.5	17	20	62
Portland, Oreg	59			3	0	37
Providence	58	10.6	9.3	4	9	37
Richmond	72	19.3	16.4	9	7	133
White	38			2	4	45
Colored	34	(5)	(5)	7	3	305
Rochester	69	11.0	10.0	4	9	35
St. Louis	262	16.1	12.6	23	16	75
St. Paul	44			3	1	30
Salt Lake City [4]	120	7.6	12.8	1	2	16
San Antonio	136	32.5	12.4	16	9	
San Diego	44			3	4	63
San Francisco	191	17.0	17.7	5	9	34
Schenectady	22	12.3	12.9	2	2	62
Seattle	65	8.8	8.0	1	5	10
Somerville	7	3.6	6.1	0	1	0
Spokane	23	11.0	7.2	1	0	26
Springfield, Mass	22	7.7	7.3	3	1	47
Syracuse	37	9.7	9.4	6	3	74
Tacoma	27	12.7	9.0	0	2	0
Toledo	81	13.5	12.8	5	7	46
Trenton	42	15.8	15.0	4	4	74
Utica	27	13.5	12.0	2	3	57
Washington, D. C	182	17.2	10.9	23	14	134
White	108			10	7	86
Colored	74	(5)	(5)	13	7	231
Waterbury	20			1	2	26
Wilmington, Del	30	12.2	8.1	2	0	45
Worcester	44	11.6	8.4	4	1	52
Yonkers	17	7.3	7.3	2	0	48
Youngstown	34	10.2	5.7	1	3	16

[1] Annual rate per 1,000 population, estimated for the year 1928.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 73 cities.
[4] Deaths for week ended Friday.
[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

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

Reports for Weeks Ended July 26, 1930, and July 27, 1929

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 26, 1930, and July 27, 1929

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 26, 1930	Week ended July 27, 1929	Week ended July 26, 1930	Week ended July 27, 1929	Week ended July 26, 1930	Week ended July 27, 1929	Week ended July 26, 1930	Week ended July 27, 1929
New England States:								
Maine	4	2	1	1	6	19	0	0
New Hampshire	1				5	16	0	0
Vermont		1			1	3	0	0
Massachusetts	23	46		4	153	149	1	4
Rhode Island	1	2			10	9	0	0
Connecticut	6	13		4	8	18	2	2
Middle Atlantic States:								
New York	63	124		[1] 4	360	200	8	18
New Jersey	52	48			172	28	5	4
Pennsylvania	69	84			269	323	6	8
East North Central States:								
Ohio	17	50	7	9	73	195	3	3
Indiana	4	12	2		13	21	5	1
Illinois	64	129	2	25	56	244	3	9
Michigan	67	62	2		98	116	5	12
Wisconsin	15	20	4	11	112	275	2	2
West North Central States:								
Minnesota	16	10			11	38	1	2
Iowa	4	7			8	9	0	1
Missouri	11	7			21	11	0	5
North Dakota	4	1			6	19	1	2
South Dakota	1				12	1	0	0
Nebraska	6	2			4	24	0	0
Kansas	6	2			38	51	3	0
South Atlantic States:								
Delaware	1				5	2	0	0
Maryland [2]	13	7	2	3	8	7	2	1
District of Columbia	8	6			13		0	0
Virginia								
West Virginia	5	10	10		17	27	1	0
North Carolina	27	26	2		10		0	0
South Carolina	8	20	68	33			0	0
Georgia	5	9	13	8	37	1	1	0
Florida	4	2		2	5	9	0	0

[1] New York City only.
[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 26, 1930, and July 27, 1929—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 26, 1930	Week ended July 27, 1929	Week ended July 26, 1930	Week ended July 27, 1929	Week ended July 26, 1930	Week ended July 27, 1929	Week ended July 26, 1930	Week ended July 27, 1929
East South Central States:								
Kentucky							2	0
Tennessee	2	1	3	6	3	10	1	0
Alabama	10	12	3	3	33	12	0	0
Mississippi	9	10					1	0
West South Central States:								
Arkansas	1	2	5	7		18	1	0
Louisiana	6	19	6	10	5	2	1	2
Oklahoma [3]	4	5	2	38	7	4	1	4
Texas	2	22	10	3	28	4	0	0
Mountain States:								
Montana		6			7	14	0	1
Idaho		2			5	18	0	0
Wyoming	1				16	9	0	1
Colorado	8	3			23	7	0	0
New Mexico	2	3			10	5	0	2
Arizona	1	2			18		1	0
Utah [3]				4	7	1	1	1
Pacific States:								
Washington	4	9			63	24	2	1
Oregon	4	9	4		29	23	0	0
California	26	29	11	7	181	43	4	17

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 26, 1930	Week ended July 27, 1929	Week ended July 26, 1930	Week ended July 27, 1929	Week ended July 26, 1930	Week ended July 27, 1929	Week ended July 26, 1930	Week ended July 27, 1929
New England States:								
Maine	0	0	16	8	0	0	2	8
New Hampshire	0	0	0	3	0	0	0	0
Vermont	0	4	1	2	0	0	0	0
Massachusetts	6	1	50	47	0	0	2	13
Rhode Island	0	0	6	4	0	0	0	3
Connecticut	4	2	10	11	0	0	2	1
Middle Atlantic States:								
New York	15	10	98	61	4	0	28	20
New Jersey	0	1	20	28	0	0	6	5
Pennsylvania	5	1	80	105	0	0	25	45
East North Central States:								
Ohio	3	3	55	98	37	58	27	28
Indiana	0	0	20	42	40	26	6	7
Illinois	6	1	72	134	38	34	32	19
Michigan	0	1	51	82	34	61	10	11
Wisconsin	0	1	36	44		11	3	2
West North Central States:								
Minnesota	16	2	16	33	2	3	5	4
Iowa	1	0	2	13	21	37	1	3
Missouri	0	0	9	13	25	2	13	11
North Dakota	1	0	10	6	9	3	1	1
South Dakota	1	0	3	1	10	10	1	0
Nebraska	0	0	4	12	18	8	17	1
Kansas	7	2	23	30	20	20	16	13
South Atlantic States:								
Delaware	0	1	5	1	0	0	0	0
Maryland [3]	1	0	6	28	0	0	25	17
District of Columbia	0	0	2	3	0	0	1	2
Virginia		[4] 34						
West Virginia	1	1	23	12	3	4	28	24
North Carolina	3	11	22	19	4	7	56	53
South Carolina	2	1	2	6	0	2	70	50
Georgia	0	0	10	5	0	0	73	47
Florida	0	0	2	5	2	0	0	9

[2] Week ended Friday.
[3] Figures for 1930 are exclusive of Oklahoma City and Tulsa.
[4] Includes 33 cases reported from Roanoke City from July 5 to July 29.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 26, 1930, and July 27, 1929—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 26, 1930	Week ended July 27, 1929	Week ended July 26, 1930	Week ended July 27, 1929	Week ended July 26, 1930	Week ended July 27, 1929	Week ended July 26, 1930	Week ended July 27, 1929
East South Central States:								
Kentucky	0	1	5	22	11	0	39	28
Tennessee	0	3	13	4	3	6	50	80
Alabama	2	0	9	15	0	0	36	39
Mississiipi	4	0	2	6	1	0	58	47
West South Central States:								
Arkansas	7	0	2	9	4	0	30	32
Louisiana	27	0	9	14	6	0	52	32
Oklahoma [3]	12	0	10	6	38	9	42	55
Texas	2	0	6	17	8	5	20	28
Mountain States:								
Montana	0	0	3	5	0	3	2	0
Idaho	0	0	0	----	1	0	1	1
Wyoming	0	0	2	1	2	8	0	2
Colorado	1	0	3	5	2	19	1	7
New Mexico	1	1	2	2	6	2	3	6
Arizona	3	0	3	----	1	5	4	0
Utah [3]	0	0	2	3	0	0	1	1
Pacific States:								
Washington	0	0	13	4	21	41	4	1
Oregon	1	1	3	4	5	13	4	3
California	89	4	44	107	6	20	32	20

[2] Week ended Friday.
[3] Figures for 1930 are exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
May, 1930										
Hawaii Territory	1	39	11	----	203	----	3	3	0	6
June, 1930										
Alabama	9	32	52	646	404	129	9	32	19	64
Idaho	5	5	----	----	46	----	0	13	24	2
Louisiana	5	59	29	195	41	186	66	63	8	108
Maine	3	35	5	----	197	----	0	40	0	7
Ohio	18	127	27	1	1,808	----	8	627	328	43
Oklahoma [1]	5	34	38	187	233	102	15	53	287	48
Oregon	1	15	24	1	386	----	1	39	69	16
Rhode Island	0	17	1	----	100	----	0	46	0	1
South Dakota	1	27	5	----	415	----	1	21	129	1
Washington	7	15	24	2	1,876	----	4	63	139	17
Wisconsin	10	50	22	----	1,735	----	4	329	88	9

[1] Exclusive of Oklahoma City and Tulsa.

May, 1930

Hawaii Territory:	Cases
Chicken pox	51
Conjunctivitis (follicular)	104
Dysentery (bacillary)	2
Hookworm disease	15
Impetigo contagiosa	1

Hawaii Territory—Continued.	Cases
Leprosy	1
Mumps	31
Tetanus	1
Trachoma	36
Whooping cough	21

June, 1930

	Cases
Anthrax:	
Louisiana	1
Oklahoma [1]	1
Chicken pox:	
Alabama	57
Idaho	75
Louisiana	26
Maine	125
Ohio	1,016
Oklahoma [1]	4
Oregon	91
Rhode Island	87
South Dakota	44
Washington	179
Wisconsin	894
Conjunctivitis:	
Maine	4
Oklahoma [1]	1
Dengue:	
Alabama	2
Diarrhea and enteritis (under 2 years):	
Ohio	18
Dysentery:	
Louisiana	4
Maine	2
Ohio	38
Food poisoning:	
Ohio	18
German measles:	
Maine	25
Ohio	15
Rhode Island	50
Washington	127
Wisconsin	65
Hookworm disease:	
Louisiana	28
Impetigo contagiosa:	
Oregon	3
Lead poisoning:	
Ohio	8
Leprosy:	
Louisiana	1
Lethargic encephalitis:	
Louisiana	3
Oregon	1
Washington	4
Wisconsin	2
Mumps:	
Alabama	65
Idaho	22
Louisiana	5
Maine	217
Ohio	353
Oklahoma [1]	13
Oregon	85
Rhode Island	2
South Dakota	11
Washington	292
Wisconsin	579
Ophthalmia neonatorum:	
Louisiana	1
Ohio	76
Paratyphoid fever:	
Louisiana	11
Maine	1
Oregon	1
Puerperal septicemia:	
Ohio	11
Washington	5
Rabies in animals:	
Louisiana	13
Rhode Island	11
Rocky Mountain spotted or tick fever:	
Idaho	2
Oregon	9
Scabies:	
Oregon	2
Septic sore throat:	
Idaho	1
Louisiana	1
Ohio	35
Oklahoma [1]	14
Washington	1
Tetanus:	
Louisiana	10
Maine	1
Ohio	12
South Dakota	1
Washington	1
Trachoma:	
Ohio	6
Oklahoma [1]	14
Rhode Island	1
South Dakota	2
Wisconsin	1
Tularaemia:	
Alabama	1
Idaho	1
Louisiana	2
Oregon	1
Typhus fever:	
Alabama	5
Undulant fever:	
Alabama	1
Maine	2
Ohio	81
Washington	4
Vincent's angina:	
Maine	7
Oklahoma [1]	1
Oregon	6
Washington	59
Whooping cough:	
Alabama	197
Idaho	73
Louisiana	27
Maine	77
Ohio	698
Oklahoma [1]	107
Oregon	160
Rhode Island	32
South Dakota	27
Washington	225
Wisconsin	672

[1] Exclusive of Oklahoma City and Tulsa.

Cases of Certain Communicable Diseases Reported for the Month of March, 1930, by State Health Officers

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid and paratyphoid fever	Whooping cough
Maine	248	12	280	410	240	0	48	11	178
New Hampshire	------	17	------	------	77	0	------	1	------
Vermont	228	6	142	20	49	15	19	0	26
Massachusetts	974	282	3,798	1,022	1,171	1	577	8	1,502
Rhode Island	70	57	16	2	108	0	33	0	156
Connecticut	489	85	90	178	580	0	138	6	197
New York	2,940	607	3,688	2,852	2,589	41	1,911	87	1,990
New Jersey	1,337	523	3,209	------	1,195	0	444	15	624
Pennsylvania	2,812	601	4,865	1,712	2,123	7	[1] 613	47	1,458
Ohio	2,162	249	3,098	984	1,750	823	642	37	803
Indiana	460	106	493	49	961	781	328	12	206
Illinois	1,399	664	2,761	977	2,512	536	976	23	834
Michigan	1,129	288	4,231	841	1,472	320	584	10	546
Wisconsin	1,427	59	3,246	1,046	708	118	195	8	947
Minnesota	466	58	1,199	------	668	27	156	22	266
Iowa	165	47	2,435	171	406	412	45	6	81
Missouri	548	239	727	256	645	448	269	19	219
North Dakota	117	14	134	292	124	71	27	11	97
South Dakota	153	24	618	47	127	280	8	2	55
Nebraska	201	79	2,036	156	354	163	32	0	103
Kansas	524	63	2,486	628	627	423	105	12	388
Delaware	44	15	45	1	56	0	[1] 12	4	14
Maryland	866	106	143	87	425	0	[1] 276	19	192
District of Columbia	114	64	40	------	71	0	121	0	37
Virginia	723	133	2,221	------	271	38	156	14	1,125
West Virginia	361	75	490	------	180	137	50	94	283
North Carolina	1,298	138	141	------	175	92	------	7	1,364
South Carolina	448	129	97	230	60	10	180	48	769
Georgia	330	44	1,018	324	103	7	101	23	175
Florida	384	30	1,388	492	31	1	24	7	79
Kentucky [2]	------	------	------	------	------	------	------	------	------
Tennessee	305	72	1,329	207	404	122	333	36	204
Alabama	447	89	1,166	140	118	27	424	39	242
Mississippi	1,158	46	688	886	57	21	313	21	1,402
Arkansas	172	50	73	77	86	90	[1] 23	6	98
Louisiana	66	86	497	10	89	9	[1] 115	59	59
Oklahoma [3]	101	77	697	82	131	449	45	34	95
Texas [3]	------	------	------	------	------	------	------	------	------
Montana	53	6	117	550	194	65	18	10	37
Idaho	63	5	375	84	44	59	9	6	31
Wyoming	18	7	46	49	41	35	[1] 1	0	13
Colorado	351	39	1,345	596	88	65	194	12	294
New Mexico	115	37	494	312	51	39	70	5	18
Arizona	64	28	95	304	81	130	148	7	69
Utah [2]	------	------	------	------	------	------	------	------	------
Nevada	58	------	30	6	------	7	[1] 3	------	6
Washington	541	31	1,200	603	252	390	213	14	320
Oregon	255	35	339	341	179	101	74	3	165
California	2,537	245	7,822	3,467	825	410	1,064	30	779

[1] Pulmonary.
[2] Reports received weekly.
[3] Exclusive of Oklahoma City and Tulsa.

Case Rates per 1,000 Population (Annual Basis) for the Month of March, 1930

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid and paratyphoid fever	Whooping cough
Maine	3.65	0.18	4.13	6.04	3.54	0.00	0.71	0.16	2.55
New Hampshire		.44			1.98	.00		.03	
Vermont	7.62	.20	4.74	.67	1.64	.50	.63	.00	.87
Massachusetts	2.61	.76	10.19	2.74	3.14	.00	1.55	.02	4.03
Rhode Island	1.11	.91	.25	.03	1.72	.00	.53	.00	2.48
Connecticut	3.33	.58	.61	1.21	3.95	.00	.94	.04	1.34
New York	2.93	.61	3.68	2.84	2.58	.04	1.91	.09	1.98
New Jersey	3.97	1.55	9.53		3.55	.00	1.32	.04	1.85
Pennsylvania	3.28	.70	5.67	2.00	2.48	.01	[1].71	.05	1.70
Ohio	3.61	.42	5.17	1.64	2.92	1.37	1.07	.06	1.34
Indiana	1.68	.39	1.80	.18	3.51	2.85	1.20	.04	.75
Illinois	2.17	1.03	4.28	1.51	3.89	.83	1.51	.04	1.29
Michigan	2.77	.71	10.40	2.07	3.62	.79	1.43	.02	1.34
Wisconsin	5.56	.23	12.64	4.07	2.76	.46	.76	.03	3.69
Minnesota	1.96	.24	5.05		2.81	.11	.66	.09	1.12
Iowa	.80	.23	11.78	.83	1.96	1.99	.22	.03	.39
Missouri	1.82	.79	2.41	.85	2.14	1.49	.89	.06	.73
North Dakota	2.15	.26	2.46	5.36	2.28	1.30	.50	.20	1.78
South Dakota	2.50	.39	10.11	.77	2.08	4.58	.13	.03	.90
Nebraska	1.65	.65	16.74	1.28	2.91	1.34	.26	.00	.85
Kansas	3.34	.40	15.83	4.00	3.99	2.69	.67	.08	2.47
Delaware	2.11	.72	2.15	.05	2.68	.00	[1].57	.19	.67
Maryland	6.17	.75	1.02	.62	3.03	.00	[1]1.96	.14	1.37
District of Columbia	2.31	1.29	.81		1.44	.00	2.45	.00	.75
Virginia	3.23	.59	9.93		1.21	.17	.70	.06	5.03
West Virginia	2.39	.50	3.24		1.19	.91	.33	.62	1.87
North Carolina	5.06	.54	.55		.68	.36		.03	5.32
South Carolina	2.77	.80	.60	1.42	.37	.06	1.11	.30	4.76
Georgia	1.19	.16	3.67	1.17	.37	.03	.36	.08	.63
Florida	3.00	.23	10.84	3.84	.24	.01	.19	.05	.62
Kentucky [2]									
Tennessee	1.42	.33	6.17	.96	1.88	.57	1.55	.17	.95
Alabama	2.01	.40	5.24	.63	.53	.12	1.90	.18	1.09
Mississippi	7.61	.30	4.52	5.83	.37	.14	2.06	.14	9.22
Arkansas	1.02	.30	.43	.46	.51	.53	[1].14	.04	.58
Louisiana	.39	.51	2.95	.06	.53	.05	[1].68	.35	.30
Oklahoma [3]	.54	.41	3.72	.44	.70	2.40	.24	.18	.51
Texas [3]									
Montana	1.14	.13	2.51	11.80	4.16	1.39	.39	.21	.79
Idaho	1.30	.10	7.75	1.74	.91	1.22	.19	.12	.64
Wyoming	.82	.32	2.09	2.23	1.86	1.59	[1].05	.00	.59
Colorado	3.68	.41	14.11	6.28	.92	.68	2.04	.13	3.09
New Mexico	3.35	1.08	14.40	9.09	1.49	1.14	2.04	.15	.52
Arizona	1.50	.65	2.22	7.10	1.89	3.04	3.46	.16	1.61
Utah [2]									
Nevada	.88		.46	.09		.11	[1].05		.09
Washington	3.89	.22	8.63	4.34	1.81	2.73	1.53	.10	2.30
Oregon	3.24	.45	4.31	4.34	2.28	1.28	.94	.04	2.10
California	6.22	.60	19.18	8.50	2.02	1.01	2.61	.07	1.91

[1] Pulmonary.
[2] Reports received weekly.
[3] Exclusive of Oklahoma City and Tulsa.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 96 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 32,080,000. The estimated population of the 90 cities reporting deaths is more than 30,520,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended July 19, 1930, and July 20, 1929

	1930	1929	Estimated expectancy
Cases reported			
Diphtheria:			
46 States	638	885	----------
96 cities	301	444	491
Measles:			
45 States	2,958	3,095	----------
96 cities	930	595	----------
Meningococcus meningitis:			
46 States	90	131	----------
96 cities	30	47	----------
Poliomyelitis:			
46 States	196	67	----------
Scarlet fever:			
46 States	823	1,203	----------
96 cities	332	384	337
Smallpox:			
46 States	500	393	----------
96 cities	38	82	28
Typhoid fever:			
46 States	787	751	----------
96 cities	95	106	112
Deaths reported			
Influenza and pneumonia:			
90 cities	271	335	----------
Smallpox:			
90 cities	0	0	----------

City reports for week ended July 19, 1930

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics, or when for other reasons the median is unsatisfactory, the epidemic periods are excluded, and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1921 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviation from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
		Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND								
Maine:								
Portland	1	1	0	----	0	0	9	0
New Hampshire:								
Concord	0	0	0	----	0	0	0	0
Manchester	0	0	0	----	0	0	0	0
Nashua	0	0	0	----	0	0	0	0
Vermont:								
Barre	0	0	0	----	0	0	0	0
Burlington	0	0	0	----	0	0	0	0
Massachusetts:								
Boston	7	24	12	1	0	58	13	11
Fall River	0	2	0	----	0	7	5	0
Springfield	1	1	2	----	0	3	2	1
Worcester	5	1	0	----	0	24	0	1
Rhode Island:								
Pawtucket	0	1	1	----	0	0	0	0
Providence	4	3	0	----	0	7	0	0
Connecticut:								
Bridgeport	0	2	0	----	0	0	0	2
Hartford	3	2	0	----	0	4	0	0
New Haven	0	1	0	----	0	3	0	1
MIDDLE ATLANTIC								
New York:								
Buffalo	6	7	8	----	1	11	7	7
New York	35	134	55	3	2	268	35	70
Rochester	1	4	0	----	0	1	1	1
Syracuse	3	2	0	----	0	10	1	2
New Jersey:								
Camden	0	3	0	----	0	7	0	3
Newark	4	8	14	----	0	14	5	3
Trenton	2	1	0	----	0	1	0	2
Pennsylvania:								
Philadelphia	9	32	14	----	3	70	22	15
Pittsburgh	8	13	10	----	0	46	0	13
Reading	1	1	0	----	0	1	4	2
Scranton	0	2	0	----	0	0	0	0
EAST NORTH CENTRAL								
Ohio:								
Cincinnati	2	3	2	----	0	16	4	1
Cleveland	49	17	6	1	0	3	12	10
Columbus	7	3	1	1	1	4	1	3
Toledo	9	3	1	----	0	1	5	4
Indiana:								
Fort Wayne	0	2	0	----	0	0	0	1
Indianapolis	8	2	2	----	0	5	2	0
South Bend	0	0	0	----	0	0	0	1
Terre Haute	0	0	0	----	0	5	0	2
Illinois:								
Chicago	44	59	74	----	1	13	36	26
Springfield	1	0	0	----	0	2	0	0
Michigan:								
Detroit	14	28	18	2	1	38	11	2
Flint	3	2	0	----	0	15	0	2
Grand Rapids	0	1	0	----	0	0	0	0

City reports for week ended July 19, 1930—Continued

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
		Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued								
Wisconsin:								
Kenosha	6	0	0		0	1	9	0
Madison	2	0	0			6	1	
Milwaukee	31	8	3		0	10	9	3
Racine	7	1	0		0	1	0	0
Superior	0	0	0		0	0	0	0
WEST NORTH CENTRAL								
Minnesota:								
Duluth	3	0	0		0	0	0	0
Minneapolis	6	9	3		0	0	2	1
St. Paul	23	4	3		0	5	0	1
Iowa:								
Davenport	2	1	0			0	0	
Des Moines	0	1	0			0	0	
Sioux City	2	0	1			4	0	
Waterloo	1	0	0			0	1	
Missouri:								
Kansas City	1	2	0		0	0	0	3
St. Joseph	0	0	1		0	0	0	4
St. Louis	4	16	11			17	5	
North Dakota:								
Fargo	1	0	0		0	1	4	0
Grand Forks	0	0	0			0	0	
South Dakota:								
Aberdeen	0	0	0			4	0	
Nebraska:								
Omaha	4	2	0		0	1	0	2
Kansas:								
Topeka	3	1	1	1	0	1	3	1
Wichita	0	0	0		0	1	0	1
SOUTH ATLANTIC								
Delaware:								
Wilmington	1	1	0		0	0	0	1
Maryland:								
Baltimore	12	10	8		0	4	11	5
Cumberland	0	0	0		0	2	0	0
Frederick	0	0	0		0	0	0	0
District of Columbia:								
Washington	6	4	8		0	27	0	2
Virginia:								
Lynchburg	2	0	0		0	2	3	0
Norfolk	1	0	0		0	0	0	2
Richmond	0	2	0		0	9	0	2
Roanoke	0	0	0		0	5	0	0
West Virginia:								
Charleston	0	0	0		0	0	6	0
Wheeling	0	0	1		0	1	0	0
North Carolina:								
Raleigh	0	0	0		0	0	0	0
Wilmington	0	0	1		0	0	0	0
Winston-Salem	0	0	0		0	0	2	2
South Carolina:								
Charleston	0	0	0	2	0	0	0	2
Columbia		0						
Georgia:								
Atlanta	0	2	1	4	0	10	1	8
Brunswick	0	0	0		0	0	0	0
Savannah	0	1	0		0	0	0	2
Florida:								
Miami	0	1	3		0	0	1	1
St. Petersburg		0			0			0
Tampa	0	0	4	1	0	1	1	1

City reports for week ended July 19, 1930—Continued

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
		Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL								
Kentucky:								
Covington	0	0	0	----	0	1	0	0
Tennessee:								
Memphis	0	1	0	----	0	1	0	3
Nashville	0	1	1	----	0	1	0	2
Alabama:								
Birmingham	0	1	1	----	0	4	0	3
Mobile	0	0	0	----	0	0	0	0
Montgomery	0	0	0	1	----	0	0	----
WEST SOUTH CENTRAL								
Arkansas:								
Fort Smith	----	0	----	----	----	----	----	----
Little Rock	0	0	0	----	0	0	0	0
Louisiana:								
New Orleans	0	5	4	2	2	1	0	4
Shreveport	0	0	0	----	0	0	1	1
Oklahoma:								
Tulsa	2	0	1	----	----	0	0	----
Texas:								
Dallas	0	2	1	----	0	2	0	2
Fort Worth	0	1	0	----	0	0	0	2
Galveston	0	0	0	----	0	0	0	0
Houston	0	2	3	----	0	0	0	3
San Antonio	0	1	2	----	1	0	1	3
MOUNTAIN								
Montana:								
Billings	0	0	0	----	0	2	0	0
Great Falls	1	0	0	----	0	0	0	0
Helena	0	0	0	----	0	0	0	0
Missoula	0	0	0	----	0	0	0	0
Idaho:								
Boise	0	0	0	----	0	0	0	2
Colorado:								
Denver	4	7	8	----	1	13	4	3
Pueblo	1	0	0	----	0	8	7	0
New Mexico:								
Albuquerque	1	1	0	----	0	0	1	0
Arizona:								
Phoenix	0	0	0	----	0	1	0	1
Utah:								
Salt Lake City	3	2	0	----	0	5	4	0
Nevada:								
Reno	0	0	0	----	0	0	0	1
PACIFIC								
Washington:								
Seattle	8	2	1	----	----	39	24	----
Spokane	3	0	0	----	----	12	3	----
Tacoma	1	2	3	----	0	14	0	0
Oregon:								
Portland	23	4	0	----	0	6	4	4
Salem	0	1	0	----	0	0	0	0
California:								
Los Angeles	15	31	7	12	1	71	39	0
Sacramento	0	2	1	----	0	7	1	2
San Francisco	7	9	4	1	1	10	11	4

City reports for week ended July 19, 1930—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	0	0	0	0	0	0	0	0	0	5	13
New Hampshire:											
Concord	0	0	0	0	0	1	0	0	0	0	12
Manchester	0	0	0	0	0	0	0	0	0	0	4
Nashua	0	0	0	0	0	0	0	0	0	0	----
Vermont:											
Barre	0	0	0	0	0	0	0	0	0	0	4
Burlington	0	0	0	0	0	0	0	0	0	0	8
Massachusetts:											
Boston	21	16	0	0	0	8	2	2	0	55	146
Fall River	1	4	0	0	0	2	0	1	0	0	20
Springfield	1	1	0	0	0	0	0	0	0	1	26
Worcester	2	2	0	0	0	1	1	0	0	15	37
Rhode Island:											
Pawtucket	1	1	0	0	0	0	0	0	0	0	6
Providence	3	1	0	0	0	4	0	0	0	18	54
Connecticut:											
Bridgeport	2	1	0	0	0	1	0	1	0	0	37
Hartford	2	1	0	0	0	0	0	0	0	0	26
New Haven	1	0	0	0	0	2	0	0	0	3	28
MIDDLE ATLANTIC											
New York:											
Buffalo	7	8	0	0	0	8	0	0	1	49	119
New York	44	22	0	0	0	86	20	3	1	125	1,219
Rochester	2	8	0	0	0	2	0	0	0	3	59
Syracuse	2	2	0	0	0	2	0	1	0	23	30
New Jersey:											
Camden	1	0	0	0	0	2	0	0	0	0	28
Newark	6	4	0	0	0	9	0	0	0	25	81
Trenton	0	0	1	0	0	3	1	0	0	2	25
Pennsylvania:											
Philadelphia	23	25	0	0	0	36	4	3	0	24	382
Pittsburgh	11	8	0	0	0	10	3	1	0	34	148
Reading	0	1	0	0	0	2	0	0	0	6	26
Scranton	1	2	0	0	0	0	0	0	0	4	----
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	5	5	1	0	0	5	1	0	0	2	118
Cleveland	14	16	0	0	0	11	2	3	0	53	159
Columbus	2	3	0	0	0	4	1	0	0	7	71
Toledo	3	2	1	1	0	1	1	1	0	3	49
Indiana:											
Fort Wayne	0	0	0	1	0	0	1	1	0	0	18
Indianapolis	2	2	2	8	0	0	0	3	0	13	----
South Bend	0	0	0	0	0	2	0	0	0	0	23
Terre Haute	1	0	0	2	0	0	0	0	0	0	14
Illinois:											
Chicago	38	57	1	1	0	43	4	3	0	80	572
Springfield	0	0	0	0	0	1	0	1	0	3	19
Michigan:											
Detroit	31	28	2	1	0	36	3	1	0	120	261
Flint	4	6	1	2	0	3	0	1	0	4	20
Grand Rapids	4	4	1	1	0	0	0	0	0	5	26
Wisconsin:											
Kenosha	0	0	0	0	0	0	0	0	0	13	5
Madison	1	0	0	1	----	----	0	0	----	15	----
Milwaukee	7	13	0	0	0	8	0	1	0	61	87
Racine	2	5	0	0	0	0	0	0	0	10	11
Superior	2	0	1	0	0	0	0	0	0	0	13
WEST NORTH CENTRAL											
Minnesota:											
Duluth	3	2	0	0	0	1	0	0	0	11	17
Minneapolis	12	1	1	0	0	2	1	4	0	1	95
St. Paul	7	5	0	0	0	5	0	0	0	9	56
Iowa:											
Davenport	0	0	1	8	----	----	0	0	----	0	----
Des Moines	2	0	0	13	----	----	0	0	----	0	32
Sioux City	0	0	0	1	----	----	0	0	----	4	----
Waterloo	1	0	0	0	----	----	0	0	----	3	----

City reports for week ended July 19, 1930—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST NORTH CENTRAL—continued											
Missouri:											
Kansas City	2	4	0	1	0	5	1	1	0	1	109
St. Joseph	0	4	1	0	0	1	0	0	0	0	30
St. Louis	7	3	1	0	0	15	4	7	0	8	442
North Dakota:											
Fargo	0	0	0	0	0	1	0	0	0	2	8
Grand Forks	0	0	0	2	----	----	0	0	----	0	----
South Dakota:											
Aberdeen	0	0	0	0	----	----	0	0	----	0	----
Nebraska:											
Omaha	1	0	0	3	0	1	0	0	0	0	84
Kansas:											
Topeka	1	3	1	0	0	0	0	0	0	20	15
Wichita	1	0	0	2	0	1	0	0	0	1	26
SOUTH ATLANTIC											
Delaware:											
Wilmington	1	1	0	0	0	0	0	0	0	1	25
Maryland:											
Baltimore	7	7	0	0	0	11	5	9	0	43	168
Cumberland	0	0	0	0	0	0	1	0	0	0	8
Frederick	0	0	0	0	0	0	0	0	0	0	----
District of Col.:											
Washington	4	5	0	0	0	13	3	2	1	12	119
Virginia:											
Lynchburg	0	0	0	0	0	0	1	2	0	13	12
Norfolk	0	0	0	0	0	1	1	0	0	0	----
Richmond	1	4	0	0	0	1	1	0	0	1	38
Roanoke	1	0	0	0	0	0	1	1	0	1	12
West Virginia:											
Charleston	0	1	0	0	0	0	2	1	0	16	18
Wheeling	1	2	0	0	0	0	0	0	0	2	15
North Carolina:											
Raleigh	0	0	0	2	0	3	1	0	0	0	19
Wilmington	0	0	0	0	0	0	0	1	0	3	9
Winston-Salem	1	0	1	0	0	2	1	0	0	13	12
South Carolina:											
Charleston	0	0	0	0	0	0	1	0	0	0	20
Columbia	0	----	0	----	----	----	1	----	----	----	----
Georgia:											
Atlanta	2	3	0	0	0	3	3	2	1	48	87
Brunswick	0	0	0	0	0	0	0	0	0	0	3
Savannah	0	0	0	0	0	4	1	2	0	0	24
Florida:											
Miami	1	0	0	0	0	2	0	0	0	0	26
St. Petersburg	0	----	0	----	0	0	0	----	0	----	4
Tampa	0	1	0	0	----	2	0	0	0	0	23
EAST SOUTH CENTRAL											
Kentucky:											
Covington	0	0	0	0	0	1	0	0	0	0	12
Tennessee:											
Memphis	1	1	0	0	0	7	8	3	0	0	138
Nashville	1	0	0	0	0	5	5	5	0	1	53
Alabama:											
Birmingham	0	2	0	0	0	6	4	2	1	3	92
Mobile	0	0	0	0	0	4	0	0	0	0	26
Montgomery	0	0	0	0	----	----	2	0	----	0	----
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	----	0	----	----	----	0	----	----	----	----
Little Rock	0	0	0	0	0	1	2	0	0	0	----
Louisiana:											
New Orleans	3	1	0	0	0	10	4	2	1	9	128
Shreveport	0	0	0	0	0	2	3	1	1	0	35
Oklahoma:											
Tulsa	1	1	0	3	----	----	2	0	----	1	----

City reports for week ended July 19, 1930—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST SOUTH CENTRAL—contd.											
Texas:											
Dallas	1	1	0	0	0	1	3	1	0	0	57
Fort Worth	1	0	0	0	0	1	2	0	0	0	23
Galveston	0	0	0	0	0	1	0	2	0	0	8
Houston	1	3	0	2	0	3	1	7	0	0	68
San Antonio	0	1	0	0	0	4	1	3	0	0	57
MOUNTAIN											
Montana:											
Billings	0	0	0	0	0	1	0	0	0	0	10
Great Falls	1	1	1	0	0	0	0	0	0	0	7
Helena	0	0	0	0	0	0	0	0	0	10	6
Missoula	0	0	1	2	0	0	0	2	0	0	1
Idaho:											
Boise	0	0	1	0	0	0	0	0	0	2	7
Colorado:											
Denver	4	8	0	0	0	8	2	0	0	43	80
Pueblo	1	0	1	0	0	0	2	0	1	4	9
New Mexico:											
Albuquerque	0	0	0	0	0	3	0	0	0	0	8
Arizona:											
Phoenix	0	0	0	0	0	1	0	2	0	0	12
Utah:											
Salt Lake City	2	0	0	0	0	1	0	1	0	45	29
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	4
PACIFIC											
Washington:											
Seattle	3	1	1	1	----	----	1	0	----	25	----
Spokane	0	0	1	4	----	----	0	0	----	12	----
Tacoma	1	1	2	0	0	0	0	2	0	2	15
Oregon:											
Portland	1	1	6	5	0	3	0	1	0	3	73
Salem	0	0	1	0	0	0	0	0	0	1	----
California:											
Los Angeles	17	14	1	0	0	34	2	3	1	34	318
Sacramento	1	4	0	3	0	0	1	2	0	0	22
San Francisco	5	4	1	1	0	9	1	1	0	1	152

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	0	0	0	0	0	0	0	3	0
Worcester	1	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
Buffalo	1	0	0	0	0	0	0	3	1
New York City	5	4	3	1	0	0	8	1	0
Syracuse	0	0	0	0	0	0	1	4	1
New Jersey:									
Newark	0	0	1	0	0	0	1	1	0
Pennsylvania:									
Philadelphia	2	0	0	0	0	1	1	3	0
Pittsburgh [1]	1	0	0	0	0	0	1	1	1

[1] Rabies (in man): 1 death at Pittsburgh, Pa.

City reports for week ended July 19, 1930—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	1	1	0	0	0	0	0	1	0
Cleveland	0	0	0	0	0	1	0	0	0
Columbus	0	0	1	1	0	0	0	0	0
Toledo	0	1	0	0	0	0	0	0	0
Indiana:									
Indianapolis	1	0	0	0	0	0	0	1	0
Illinois:									
Chicago	3	1	1	2	0	0	1	0	0
Springfield	0	0	0	0	0	0	0	2	0
Michigan:									
Detroit	2	5	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	0	1	0	0	0	0	0	0	0
Missouri:									
St. Joseph	1	0	0	0	0	0	0	0	0
St. Louis	4	1	0	0	0	0	0	0	0
North Dakota:									
Grand Forks	1	0	0	0	0	0	0	0	0
Kansas:									
Topeka	1	0	0	0	0	0	0	0	0
Wichita	0	0	0	0	0	0	0	0	1
SOUTH ATLANTIC									
Maryland:									
Baltimore	1	0	0	0	0	1	1	0	0
Virginia:									
Lynchburg	0	0	0	0	0	1	0	0	0
Norfolk	0	0	0	0	0	0	0	2	0
West Virginia:									
Charleston	1	1	0	0	0	0	0	0	0
North Carolina:									
Raleigh	0	0	0	0	3	0	0	0	0
Winston-Salem	0	0	0	0	10	0	0	0	0
South Carolina:									
Charleston	0	0	0	0	11	1	0	0	0
Georgia:									
Atlanta	0	0	0	0	1	1	0	0	0
Savannah	0	0	0	0	1	0	0	0	0
Florida:									
Tampa	0	0	0	0	0	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	3	1	0	0	1	0	0	0	0
Alabama:									
Birmingham	0	0	0	0	1	1	1	0	0
Montgomery	0	0	0	0	2	0	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	0	0	0	0	2	3	0	0	0
Shreveport	0	0	0	1	0	1	0	2	0
Texas:									
Dallas	0	0	0	0	2	0	0	0	0
Houston [2]	0	0	0	0	0	1	0	1	0
MOUNTAIN									
Montana:									
Great Falls	2	0	0	0	0	0	0	0	0
Utah:									
Salt Lake City	1	0	0	0	0	0	0	0	0
PACIFIC									
Oregon:									
Portland	2	1	1	0	0	0	0	2	0
California:									
Los Angeles	0	1	0	0	0	0	1	31	3
San Francisco	0	0	0	0	1	0	0	1	0

[2] Typhus fever: 1 case at Houston, Tex.

The following table gives the rates per 100,000 population for 98 cities for the 5-week period ended July 19, 1930, compared with those for a like period ended July 20, 1929. The population figures used in computing the rates are approximate estimates, authoritative figures for many of the cities not being available. The 98 cities reporting cases have an estimated aggregate population of more than 32,000,000. The 91 cities reporting deaths have more than 30,500,000 estimated population.

Summary of weekly reports from cities, June 15 to July 19, 1930—Annual rates per 100,000 population, compared with rates for the corresponding period of 1929 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	June 21, 1930	June 22, 1929	June 28, 1930	June 29, 1929	July 5, 1930	July 6, 1929	July 12, 1930	July 13, 1929	July 19, 1930	July 20, 1929
98 cities	68	112	67	110	59	89	59	88	[2] 49	73
New England	35	74	62	94	51	70	38	79	33	83
Middle Atlantic	81	125	65	144	59	101	52	99	48	76
East North Central	93	165	98	131	91	128	87	119	66	105
West North Central	34	87	70	85	36	77	66	69	38	54
South Atlantic	33	64	24	34	24	34	29	43	[3] 43	30
East South Central	13	34	13	34	40	27	27	41	13	27
West South Central	86	65	37	69	52	72	64	84	[4] 38	69
Mountain	9	26	0	26	9	26	26	26	69	17
Pacific	54	58	64	84	38	43	61	41	38	41

MEASLES CASE RATES

98 cities	656	423	500	267	276	195	257	150	[2] 151	98
New England	1,048	391	762	211	498	209	421	186	235	146
Middle Atlantic	818	123	640	99	339	76	322	51	205	47
East North Central	381	1,010	334	620	170	474	155	351	71	210
West North Central	658	504	264	256	137	114	127	104	57	52
South Atlantic	375	129	234	137	165	73	130	49	[3] 114	43
East South Central	270	41	256	7	142	27	202	14	47	7
West South Central	82	183	19	156	26	69	19	61	[4] 11	4
Mountain	2,617	218	1,416	148	712	148	566	104	240	61
Pacific	1,247	352	931	208	527	138	562	152	361	109

SCARLET FEVER CASE RATES

98 cities	145	148	109	112	77	88	72	83	[2] 54	64
New England	115	159	124	119	66	90	66	83	60	56
Middle Atlantic	118	100	89	72	57	46	51	41	37	35
East North Central	229	260	184	191	116	173	115	160	87	103
West North Central	148	77	97	104	102	38	83	79	42	54
South Atlantic	97	73	62	62	57	60	62	64	[3] 45	69
East South Central	67	89	61	34	13	55	47	48	20	55
West South Central	105	88	41	42	49	23	37	42	[4] 23	72
Mountain	197	96	60	70	163	44	86	35	77	78
Pacific	85	210	57	164	45	135	50	89	57	65

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1930, and 1929, respectively.
[2] Columbia, S. C., and Fort Smith, Ark., not included.
[3] Columbia, S. C., not included.
[4] Fort Smith, Ark., not included.

Summary of weekly reports from cities, June 15 to July 19, 1930—Annual rates per 100,000 population, compared with rates for the corresponding period of 1929—Continued

SMALLPOX CASE RATES

	Week ended—									
	June 21, 1930	June 22, 1929	June 28, 1930	June 29, 1929	July 5, 1930	July 6, 1929	July 12, 1930	July 13, 1929	July 19, 1930	July 20, 1929
98 cities	10	9	13	15	7	15	7	8	[2] 6	13
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	8	18	10	38	5	41	9	19	10	32
West North Central	30	6	51	19	13	13	9	15	13	21
South Atlantic	2	6	9	2	2	2	0	2	[3] 4	2
East South Atlantic	20	0	7	7	20	21	20	7	0	7
West South Central	26	4	22	4	0	11	7	15	[4] 8	0
Mountain	34	61	51	113	51	35	9	35	17	44
Pacific	43	31	50	14	38	24	43	10	21	34

TYPHOID FEVER CASE RATES

98 cities	8	8	13	12	10	10	16	14	[2] 15	18
New England	0	4	9	9	7	4	4	4	9	9
Middle Atlantic	4	2	5	7	6	6	10	7	4	10
East North Central	3	4	10	3	1	4	6	7	9	8
West North Central	8	19	13	15	8	13	9	10	23	19
South Atlantic	22	13	37	30	26	32	55	7	[3] 37	32
East South Central	54	55	67	34	94	48	94	157	67	144
West South Central	26	34	34	34	49	8	37	84	[4] 61	57
Mountain	9	9	34	52	0	17	0	9	26	52
Pacific	7	5	5	19	5	7	17	2	19	5

INFLUENZA DEATH RATES

91 cities	4	6	3	5	4	2	4	3	[2] 3	3
New England	2	2	0	2	2	0	0	2	0	0
Middle Atlantic	5	3	2	4	4	3	4	2	3	2
East North Central	4	8	3	4	2	1	3	3	2	3
West North Central	0	6	0	0	0	0	6	0	0	3
South Atlantic	2	6	5	4	5	2	2	4	[3] 0	6
East South Central	15	15	15	15	7	15	15	7	0	0
West South Central	8	16	11	4	15	4	8	4	11	20
Mountain	0	0	0	44	0	0	0	26	9	0
Pacific	0	6	3	3	9	0	3	0	6	3

PNEUMONIA DEATH RATES

91 cities	74	81	68	64	55	63	54	55	[2] 44	55
New England	69	56	49	58	29	49	40	29	35	70
Middle Atlantic	82	89	75	65	58	67	57	62	56	65
East North Central	53	76	56	69	41	56	38	50	32	40
West North Central	109	48	86	48	62	63	74	51	38	36
South Atlantic	64	84	66	62	55	69	55	58	[3] 47	54
East South Central	133	119	103	75	162	75	81	30	59	52
West South Central	69	82	92	66	84	109	84	82	50	27
Mountain	129	78	77	104	60	61	103	44	51	96
Pacific	74	104	55	38	64	31	61	53	18	63

[2] Columbia, S. C., and Fort Smith, Ark., not included.
[3] Columbia, S. C., not included.
[4] Fort Smith, Ark., not included.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Week ended July 19, 1930.—The Department of Pensions and National Health reports cases of certain communicable diseases in Canada for the week ended July 19, 1930, as follows:

Province	Cerebro-spinal fever	Influenza	Lethargic encepha-litis	Poliomy-elitis	Smallpox	Typhoid fever
Prince Edward Island [1]						
Nova Scotia						2
New Brunswick						1
Quebec	2			1		11
Ontario	1	1		3	6	11
Manitoba			1			1
Saskatchewan				3		2
Alberta				1	1	
British Columbia		5				1
Total	3	6	1	8	7	29

[1] No disease included in the table was reported during the week.

Quebec Province—Communicable diseases—Week ended July 19, 1930.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the week ended July 19, 1930, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	2	Mumps	26
Chicken pox	21	Ophthalmia neonatorum	1
Diphtheria	29	Poliomyelitis	1
Erysipelas	7	Scarlet fever	41
German measles	3	Tuberculosis	61
Influenza	2	Typhoid fever	11
Measles	34	Whooping cough	38

CHINA

Meningitis.—During the week ended July 5, 1930, eight cases of meningitis, with five deaths were reported at Canton, China. Five cases and three deaths were reported during the two weeks ended July 19.

CZECHOSLOVAKIA

Communicable diseases—May, 1930.—During the month of May, 1930, communicable diseases were reported in Czechoslovakia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	6	1	Puerperal fever	63	26
Cerebrospinal meningitis	13	5	Scarlet fever	1,679	34
Diphtheria	1,543	80	Trachoma	358	----
Dysentery	17	4	Typhoid fever	428	29
Malaria	48	----	Typhus fever	12	----
Paratyphoid fever	11	2			

MEXICO

Vera Cruz—Deaths from certain diseases—Six weeks ended July 12, 1930.—During the six weeks ended July 12, 1930, deaths from certain diseases were reported in Vera Cruz, Mexico, as follows:

Disease	Week ended—						
	June 7	June 14	June 21	June 28	July 5	July 12	Total
Bronchitis	2	2	3	----	2	1	10
Cancer	1	----	1	----	1	1	4
Cerebrospinal meningitis	----	----	2	----	1	1	4
Diphtheria	----	1	----	----	----	----	1
Dysentery	----	----	----	1	----	----	1
Gastro-intestinal disorders	10	11	14	17	11	13	76
Hookworm disease	----	----	----	----	2	----	2
Influenza	1	----	----	----	----	----	1
Malaria	----	4	1	----	----	----	5
Pneumonia	5	4	4	3	5	10	31
Tuberculosis	4	6	4	1	6	9	30
Typhoid fever	2	2	2	1	----	2	9

PHILIPPINE ISLANDS

Cholera—May to July, 1930.—A report dated June 26, 1930, from the chief quarantine officer of the Philippine Islands, gives the following information relative to the occurrence of cholera in the Philippine Islands:

On or about May 21, 1930, suspicious cases of gastro-intestinal disease began to occur in the vicinity of the town of Cadiz, which is not far from the northeast coast of the island of Negros. The clinical findings were those of cholera, but not until a considerable time after the occurrence of the first cases was it possible to ascertain definitely that the disease was actually cholera.

The disease soon appeared at points some distance from Cadiz, particularly on the island of Bantayan, which is in the strait northeast of Negros and northwest of Cebu, but belongs to the Province of Cebu. On this island eight small villages had become infected by June 26, and on June 3, 1930, one case was carried from Bantayan to

the port of Cebu, dying in a small boat immediately before arrival there. An autopsy showed that the disease was cholera. All contacts were quarantined at the Cebu Quarantine Station, but were released after three separate bacteriological examinations.

Later reports show that there were about 1,700 cases of cholera with approximately 850 deaths in the Philippine Islands from the beginning of the outbreak to July 26, 1930.

The Philippine Health Service is taking measures to check the spread of the disease.

SCOTLAND

Aberdeen—Smallpox.—During the week ended July 12, 1930, a death from smallpox occurred at Aberdeen, Scotland. The registrar general of Scotland states that this is the first death from smallpox in Scotland since 1921.

VIRGIN ISLANDS

Communicable diseases—May, 1930.—During the month of May, 1930, cases of certain communicable diseases were reported in the Virgin Islands as follows:

St. Thomas and St. John:		St. Croix:	
Chancroid	1	Gonorrhea	1
Gonorrhea	4	Syphilis	11
Syphilis	9	Tuberculosis	1
Tuberculosis	2	Uncinariasis	5

YUGOSLAVIA

Communicable diseases—June, 1930.—During the month of June, 1930, certain communicable diseases were reported in Yugoslavia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	33	3	Puerperal septicemia	1	1
Cerebrospinal meningitis	11	5	Scarlet fever	931	129
Diphtheria	361	48	Smallpox	1	----
Dysentery	37	4	Tetanus	43	26
Erysipelas	176	7	Typhoid fever	212	16
Glanders	1	1	Typhus fever	6	----
Measles	1,515	16			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Apr. 6–May 3, 1930	Week ended— May, 1930				June, 1930				July, 1930			
						10	17	24	31	7	14	21	28	5	12	19	26
Afghanistan	C														[1] P		
China:																	
Canton	C						1	1	1		2				2		
Manchuria—Dairen	C		1														
Swatow	C								3	4	3						
India	C	6,461	5,914	10,817	41,462	15,596	14,600	12,468	13,647								
	D	3,606	3,371	5,866	27,906	12,782	11,882	9,756	10,458								
Bassein	C				7	3	4										
	D				5	3	2										
Bombay	C			4													
Calcutta	C	202	269	354	647	194	175	142	98	78	73	94	77	81	53		
	D	110	153	220	414	125	107	83	57	44	36	36	63	54	28		
Negapatam	C	12									1						
	D	4									1						
Rangoon	C	3	3	2	1		5	2	2	1	1	2	2	1			
	D	3	1	2	1		1		2	1	1	1	1	1			
Tuticorin	C	3															
	D	1															
India (French):																	
Chandernagor	C		4	1	6	2	2	2				1	2				
	D		2	3	5	1	4	1				1	1				
Karikal	C		4	12	1								3				
	D		1	9	1								3				
Indo-China (see also table below):																	
Pnompenh	C	11	9		2	1				5	10	11	14	9	16		
	D	8	7	6			2	2	1	1	4	7	6	6	9		
Saigon and Cholon	C	2	5	14	76	59	40	48	13	17	19	7	5	7	1		
	D	2	4	6	55	43	27	24	7	11	10	2		3			

Philippine Islands:																			
Bulacan Province—																			
Malolos	C									1			1					1	
	D									1									
Obando	C																	2	
Santa Maria	C												1						
Capiz Province—																			
Capiz	C																	2	
	D																	1	
Paniten	C																	1	
	D																	1	
Cebu Province—																			
Bantayan	C									3	10	86	86	134	94	67	30		
	D									3	9	39	43	8	41	36	16		
Barili	C												1	1					
	D													1					
Bogo	C										1	3	1	23	21	6	11		
	D										1	1	1	11	9	4	8		
Borbon	C																1		
	D																1		
Cebu	C												20	14	13	13	9		
	D												9	6	7	12	8		
Madridejos	C												15	13	3	1			
	D												8	5	1	1			
Medellin	C												1	18	38	6	2		
	D													6	9	3	1		
Opon	C															11			
	D															1			
San Remigio	C											3	8	38	23	12	3		
	D											2	4	8	5	2	1		
Sante Fe	C									1									
	D									1									
Tobogon	C														13	1			
	D														6	2			
Iloilo Province—																			
Akuy	C															9			
	D															4			
Ajux	C																4		
	D																3		
Concepcion	C															1			
Iloilo port	C														1	11	17		
	D															9	13		
Jaro	C															4	4		
	D															3	2		
La Paz	C														2	7	24		
	D														3	5	8		
Lumbeno	C															1			
	D															1			
Miagao	C												1	1		17	8		
	D													2		11	5		

[1] An outbreak of cholera was reported in June, 1930, in Afghanistan.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 12-Feb. 8, 1930	Feb. 9-Mar. 8, 1930	Mar. 9-Apr. 5, 1930	Apr. 6-May 3, 1930	Week ended— May, 1930 10	17	24	31	June, 1930 7	14	21	28	July, 1930 5	12	19	26
Philippine Islands—Continued.																	
Iloilo Province—Continued.																	
Ottro	C																3
	D																2
Paist	C															1	
Pavia	C															1	
San Miguel	C															24	5
	D															19	5
Santa Barbara	C															1	1
	D															1	1
Tigbauan	C															1	
	D															1	
La Union Province—Rosario	C														1		
Leyte Province—Maripipi	C										1	15	20				
	D											11	9				
Manila	C							1									
Masbate Province—																	
Cataingan	C												10	20	21	8	
	D												3	4	14	2	
Catbabayn	C														4		20
	D														1		4
Misami Province—San Miguel	C														2		
	D														2		
Neuva Ecija Province—																	
San Leonardo	C																1
	D																1
Occidental Negros Province—																	
Bacolod	C											9			4	13	13
	D											8			4	9	9
Bago	C															2	8
	D															1	5
Binalbagan	C														9	11	22
	D														3	3	9
Cadiz	C								10	2	10	10	3	3	1	7	2
	D								7	1	3	5	3	4	1	5	2
Calatrava	C											3			1		
	D											2			1		

Cauyan	C																1		
	D																1		
Escalante	C									1					22		12	1	
	D									1					7		10	3	
Guiyhulgan	C																6		
	D																3		
Himalayan	C																	14	
	D																	5	
Hinigaran	C																16	6	
	D																11	6	
Isabela	C														11		13	21	
	D																3	5	
La Carlota	C												3	1			2	2	
	D												1	1			1	1	
La Castellana	C												4	3	5		6	4	
	D												2	3	3		3	3	
Manapla	C																3		
	D																2		
Mariagla	C																1		
	D																1		
Murcia	C																1	1	
	D														3			1	
Pinamalayan	C																16		
	D																13		
Polupandan	C														1			1	
	D														1			1	
Pontevada	C														7		13	9	
	D														3		14	4	
Puludan	C														1		3		
	D														1		3		
Sagay	C																10	10	
	D													1			6	6	
San Antonio	C										1								
	D										1								
San Carlos	C														6		5	4	
	D														3		1	4	
San Enrique	C														5		19	5	
	D														3		12	6	
Saravia	C																4	1	
Sjlay	C														6		11	11	
	D														6		10	5	
Talisay	C											7	4		6		11	3	
	D											7	1		4		7	4	
Valladolid	C														3		13	24	
	D														4		12	22	
Oriental Negros Province—																			
Guishlnag	C																	9	
	D																	5	
Pavia	C																	5	
	D																	2	
Vallehermosa	C																	3	
	D														1			2	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Apr. 6–May 3, 1930	Week ended— May, 1930 10	17	24	31	June, 1930 7	14	21	28	July, 1930 5	12	19	26
Philippine Islands—Continued.																	
Pampanga Province—																	
Angeles	C												1				
Bacolor	C												1				
Lubao	C													2			
Pangasinan Province—																	
Binmaley	C													2			
Urdantea	C															1	
Rizal Province—Navotas	C								1								
	D								1								
Siam	C	3	7	1	29	12	4	13	4			6					
	D		4		13	10	2	7	2			4					
Bangkok	C	3	2	2	15			6	3	5	3	3	1		3		
	D			1	4			2	1		3		2		1		
Nagara Pathom	C		1		10												
	D		1		2										8		
Songkla	C														4		
	D																
On vessel:																	
S. S. at Suva, Fiji Islands	C		1														
S. S. Sutley, at Batavia, from Calcutta	C		1														
S. S. Sassari, at Massoua, from Jeddah	C								1								
	D								1								
On small boat at Port Cebu, from Bantayan Island	C									1							
	D									1							

Place		December, 1929	January, 1930	February, 1930	March, 1930 1–10	11–20	21–31	April, 1930 1–10	11–20	21–30	May, 1930 1–10	11–20	21–31	June, 1930 1–10	11–20
Indo-China (French) (see also table above):															
Annam [1]	C		1	4		52				60		20	3	2	14
Cambodia [1]	C	41	147	90	49	32		18	6		5	31	52	56	88
Cochin-China [1]	C	46	177	65	5	22	55	48			188	224	259	147	126

[1] Reports incomplete.

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Apr. 6–May 3, 1930	Week ended— May, 1930				June, 1930				July, 1930			
						10	17	24	31	7	14	21	28	5	12	19	26
Algeria:																	
Algiers	C														1	2	
Constantine	C									1				1			
Argentina:																	
Andalgala [1]																	
Rosario	C	P															
Santa Fe	C	6															
Villa Lia	D		2														
Azores: Ponta Delgada	C				8												
	D				5												
Belgian Congo	C													2			
	D													2			
Brazil:																	
Rio de Janeiro	C	1															
	D	1															
Sao Paulo.[2]																	
British East Africa (see also table below):																	
Tanganyika	C		7		44												
	D				20												
Uganda	C	82	47	98	117	54	89		84	121							
	D	70	43	87	105	48	75		72	75							
Ceylon:																	
Colombo	C	4	3	4	1	4	1		1	1				1	2		
	D	4	3	4	1	3	1		1	1				1	2		
Plague-infected rats		1	3	2	4					1							
Chile: Antofagasta	C	1	1	1	1												
	D			2	1												
Dutch East Indies:																	
Batavia and West Java	C	167	153	124	87	18	33	17	14	19	27						
	D	164	150	122	81	18	33	17	14	19	27						
Plague-infected rats		3	3	3	8			3	2	3	1						
Celebes—Makassar	C	1															
	D	1															
Java and Madura	D	317	296	223	173	28	74	36	48	40							
Ecuador (see table below).																	

[1] On Mar. 11, 3 deaths from bubonic plague were reported in Andalgala, Catamarca Province, Argentina, since Feb. 5, 1930.

[2] 21 cases of plague with 8 deaths were reported Jan. 29, 1930, in the State of Sao Paulo, Brazil; 15 of these cases were in the city of Sao Paulo.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Apr. 6–May 3, 1930	Week ended— May, 1930 10	May, 1930 17	May, 1930 24	May, 1930 31	June, 1930 7	June, 1930 14	June, 1930 21	June, 1930 28	July, 1930 5	July, 1930 12	July, 1930 19	July, 1930 26
Egypt:																	
Alexandria	C	4	1	4	2	2	3	3	5	3	6	6	4	8	8	3	4
	D	1		1	2			1	2	2		2	5	2	3	2	3
Assiout	C				14	3	9	2	6	4	2	3		1	1		
	D				5		3	1	1		1		2	1	1		
Beheira	C	2		4													
Beni Suef	C			4													
Dakahlieh	C		8	5	5	3	1	2	5	1							
	D			1			1	1									
Gharbieh	C	1			1												
	D				1												
Girga	C				1										1		
Minieh	C							6	1	1	1	4	4	2	1		
	D								1		1						
Port Said	C				1		1	1		1			1				1
France: St. Ouen	C															1	
	D															1	
Greece (see also table below):																	
Patras	C			1								1					
Piraeus	C	1															
Pyrgos	C			1													
Hawaii Territory, Hamaqua, Hawaii: Plague-infected rats												1					
India	C	4,814	5,639	4,087	2,215	281	188	117	62								
	D	3,308	3,940	3,344	1,960	271	205	103	56								
Bassein	C	1		3													
	D	1		1													
Bombay	C	1	1	7	4	4	1		1	1		2					
	D	1	1	5	8	1	4					1	1				
Plague-infected rats		28	31	86	108	23	39		19	6	7	8	5	13	14		
Madras Presidency	C	27	230	157	44	2		6	30	26		2			1		
	D	13	140	87	19		1	4	6	15					1		
Rangoon	C	3	7	3	5		1	3					1				
	D	2	6	3	4	1	1	1					1				
Plague-infected rats		1	7	3	4	1	3	1				1		2	2		
India (Portuguese)	D					7											

Indo-China (see also table below):																	
Pnompenh	C	1			3	1			2	6					1		
	D	2	13	13	4			1		5	1		1				
Saigon and Cholon	C	2		1		1				1		1					
	D	2		1								1					
Iraq: Baghdad	C	6	6	7	6	7	11	7	12	12	4	8	4	10	4	2	2
	D	2	1	4	2	3	5	4	6	7	3	5		5		1	1
Japan: Osaka (vicinity of)—Plague-infected rats		7	6	4	3												
Kwang-Chow-Wan	C	25	25	7	37		20		14	23		8					
Madagascar (see also table below): Tamatave	C				1					1							
Morocco	C	4	48	55	121	19	22	18	12	2		1					
	D		13	18	45	11	14	6	3	4							
Nigeria: Lagos	C	6	7	13		1	1			1		3	1	1			
	D	6	7	5		1	1			1		3	1	1			
Plague-infected rats		44	42	25	7	2	6	5	4	1							
Senegal (see table below).																	
Siam	C	8	17	16	5		1	1	3								
	D	6	13	15	6		1		3								
Bangkok	C		1	5			1	1	3								
	D		1	4			1		3								
Nagara Pathom	C	7	5	1	10												
	D	7	6	1	9												
Nagara Rajsima	C	2	2	1	1												
	D			1	1												
Syria: Beirut	C										2	1	1		2	4	3
Tunisia:																	
Sfax district	C	18	22		1	17			4	6		3					
Tunis	C	6	5	1	4				1		1				1		
	D									1					1		
Union of Socialist Soviet Republics:																	
Salsk Region	C									1			1				
	D									1							
Stavropol Region	C									1							
	D									1							
Union of South Africa:																	
Cape Province	C	1	2	1		P				1							
	D		1	1													
Orange Free State	C	15	11	5	1												
	D	9	3	3													
Transvaal	C	8	2	1													
	D	3		1													
On vessel:																	
At Rio de Janeiro, Brazil, from Argentina	C	1															

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		January, 1930	February, 1930	March, 1930	April, 1930	May, 1930	June, 1930
British East Africa (see also table above):							
Kenya	C	34	69	85	16	171	75
Uganda	C	184	109	------	------	------	------
	D	155	90	------	------	------	------
Ecuador: Guayaquil	C	4	2	2	0	------	------
	D	2	2	------	0	------	------
Plague-infected rats		4	2	2	0	------	------
Ecuador (outside of Guayaquil)	C	4	------	------	------	------	------
	D	2	------	------	------	------	------
Greece (see also table above)	C	------	------	------	1	------	1
Indo-China (see also table above)	C	10	30	27	4	------	11
Madagascar (see also table above)	C	282	------	------	------	------	------
	D	258	------	------	------	------	------
Ambositra Province	C	128	49	25	14	------	------
	D	111	41	20	12	------	------
Antisirabe Province	C	26	22	38	46	------	------
	D	25	22	36	45	------	------
Itasy Province	C	31	------	4	------	------	------
	D	31	------	4	------	------	------
Miarinarivo Province	C	------	25	14	1	------	------
	D	------	25	14	1	------	------

Place		January, 1930	February, 1930	March, 1930	April, 1930	May, 1930	June, 1930
Madagascar (see also table above)—Con.							
Moramanga Province	C	22	7	5	3	------	------
	D	21	4	5	3	------	------
Tamatave Province	C	3	------	------	------	------	------
	D	1	------	------	------	------	------
Tananarive Province	C	88	110	52	39	------	------
	D	83	107	52	38	------	------
Senegal:							
Baol [1]	C	------	------	18	24	13	2
	D	------	------	8	12	11	2
Dakar [1]	C	------	------	------	2	52	53
	D	------	------	------	2	42	117
Louga [1]	C	------	2	------	33	54	60
	D	------	------	------	10	27	21
Thies [1]	C	3	------	3	12	21	52
	D	------	------	2	9	8	35
Tivaouane [1]	C	1	------	11	71	135	43
	D	------	------	8	38	69	28

[1] Incomplete reports.

SMALLPOX

[C indicates cases; D, deaths; P, present]

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Apr. 6–May 3, 1930	Week ended— May, 1930				June, 1930				July, 1930			
						10	17	24	31	7	14	21	28	5	12	19	26
Algeria:																	
Algiers	C	6	1	5	1		1		2								
Constantine	C	1										1					
Oran	C	5		1													
Arabia: Aden	C	1	2	3	1									1			
Bolivia: La Paz.[1]																	
Belgian Congo (see table below).																	
British Borneo: Sarawak	C	4	19														
British East Africa (see also table below):																	
Tanganyika	C	5	49	103	57	33	45	55	276	385	755						
	D		8	7	14	3	5	8	54	154	90						
British South Africa:																	
Northern Rhodesia	C			9	1			57	2								
	D				2			9									
Southern Rhodesia	C	1	6		66	53		42	60	75	1						
	D				1	4		8	1								
Canada:																	
Alberta	C	22	4	10	4										2	1	
Edmonton	C	19	1	4	3												
British Columbia—Vancouver	C	16	16	20	17			2	2	1	1			2	2		
Manitoba	C	6	2	4	4			7	3			4					
Ontario	C	63	86	100	77	14	24	24	20	14	10	13	10	3	5	6	
Fort William	C	4															
North Bay	C	2	1			1											
Ottawa	C	10	11	19	21	3	10	7	5	6		8	1	1	1	4	7
Toronto	C	2						3	1	2	1	1			1		
Quebec	C	11											4	3			
Montreal	C	1															
Saskatchewan	C	86	76	47	41	20	6	10	3		12	10			2		
Regina	C					1		3									
Ceylon:																	
Angoda, Western Province	C		10		6												
	D		1		2												
Colombo	C	1	3														
	D		2														

[1] From Jan. 1 to May 31, 1930, 44 deaths from smallpox were reported in La Paz, Bolivia.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Apr. 6–May 3, 1930	Week ended— May, 1930 10	17	24	31	June, 1930 7	14	21	28	July, 1930 5	12	19	26
China:																	
Canton	C	7	11	6	3					1							
	D	2	3	2	3												
Chungking	C	P	P		P	P		P	P	P			P				
Foochow	C	P	P		P		P		P		P		P				
Hong Kong	C	118	62	38	18	5	5	2		2	1	1			2		
	D	109	51	25	23	4	2	3		1		1	1		1		
Manchuria—																	
Harbin	C	3			1		10	10									
Kwantung—Dairen	C	6	5		2	1		7			11	5		8			
	D							4				1					
Nanking	C	P	P	P	P	P			P	P	P						
Shanghai—																	
Foreigners only	C	5	2	2	3		1	1		1	1	1	2	1			
Including natives	D	8	7	10	10		1	2	2	1		1	1				
Swatow	D	3	6	6	3	1		1	4	1		1	2				
Tienstsin	C	1	1	2	2	1											
Chosen (see table below).																	
Colombia:																	
Baranquilla	C		102	2	1												
Buenaventura	C		1		15	2		1	1	1	1		4	4			
Costa Rica:																	
Port Limon	C				6				2	2							
San Jose [2]	C			10	7												
Curacao (alastrim)	C			14	2	2					1						
Dahomey (see table below).																	
Dutch East Indies:																	
Borneo	C	1		185	90		10	4	2	2	10				2		
	D	1		12	31	1					1						
Java—																	
Batavia and West Java	C	14	14	78	64	1	1	5	5	1	4			3	1		
	D	7	7	6	11	1	1	3	2		1			2	1		
East Java and Madura	C				4												
Sanggi Islands	C	25	12	5	160	14	12										
	D			1	24	1	4										

Sumatra	C	2		48														
	D			5														
Egypt: Port Said	C	2			1		1											
Great Britain:																		
England and Wales	C	1,455	1,530	1,700	1,427	462	324	304	327	237	266	241	182	156				
Ashton under Lyne	C	4	29	15	18	6	3	4	4			3	4					
Bradford	C	5	2		3		1		1					1				
Cardiff	C			2	3									2				
Leeds	C	6	11	16	2									1				
London	C	597	699	710	602	222	138	148	129	130	136	125	107	84				
London and Great Towns	C	1,101	1,156	1,239	1,066	339	250	235	254	197	208	190	158	127				
	D	2	5	3	3													
Sheffield	C			8	2													
Stoke-on-Trent	C	12	41	122	85	19	9	13	21	3	10	15	4	3				
Scotland	C									1		3			1			
Hedjaz	C	11																
India	C	26,524	36,036	39,329	34,843	6,533	6,549	5,416	4,337									
	D	6,186	7,710	9,109	6,983	1,449	1,814	1,196	993									
Bombay	C	342	638	718	430	52	68	58	40	36	35	23	19	17	15			
	D	164	314	431	270	33	49	44	35	27	23	19	10	13	9			
Calcutta	C	185	399	361	495	109	70	52	71	56	45	45	25	27	19			
	D	130	287	305	403	94	72	40	52	50	37	29	30	17	17			
Cochin	C	234	184	291	183	13	8	7	9	4	1	10	1					
	D	27	29	35	15	5	1	2		2	1	1						
Karachi	C	30	38	33	30		6	7	1	5		1	1					
	D	9	16	47	17	2		1	1	2		1						
Madras	C	105	159	173	133	24	13	15	20	9	10	8	8	6	10			
	D	16	29	36	27	4	5	6		6	3	1		4	1			
Moulmein	C	65	143	146	43	27	29	20	13		9	6	6	4	10			
	D	18	40	41	7	4	6	5	6		3	3	1	3	4			
Negapatam	C		1					1			1		1					
Rangoon	C	7	7	10	4	2		3	1	1	5	1	2	2	1			
	D	4	2	5		1						1	1					
Tuticorin	C	3						5				1						
Vizagapatam	C	5	9	69	6	3	1	1			1							
	D		1	18	2		3											
India (French):																		
Chandernagor	C	3	11	6	10	6	2	8	8	4	8	5	2		1			
	D		5	2	2	2	4	1				2	1		1			
Karikal	C	3	12	24	19	6	5	1		4	3	1	3	1				
	D	3	8	7	8	2	1			2	2	1	3	1				
Pondicherry Province	C	22	52	21	24	9	13	10	8	4	4	9	6		9			
	D	19	40	13	20	7	12	10	7	4	4	9	6		9			
India (Portuguese)	C	16	50	38	44	2	27	5	13		3							
	D		5	2	8		3	1	1		2							
Indo-China (see also table below):																		
Pnompenh	C					1		1	1									
	D	1			2					1								
Saigon and Cholon	C	3	4	3	5	1	1		1	1								
	D	3	2	1	5		1		1									

[1] 5 cases of smallpox were reported Apr. 14, 1930, in Costa Rica outside of city of San Jose.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Apr. 6–May 3, 1930	Week ended— May, 1930 10	17	24	31	June, 1930 7	14	21	28	July, 1930 5	12	19	26
Iraq:																	
Baghdad	C	7	3	------	8	1	------	------	------	1	------	------	------	1	------	------	------
	D	3	1	------	1	1	------	------	------	------	------	------	------	------	------	------	------
Basra	C	------	1	------	1	------	------	------	------	------	------	------	------	------	------	------	------
Mossul Liwa	C	26	12	------	22	13	------	8	------	------	1	------	3	47	20	------	------
	D	7	2	------	3	2	------	1	------	------	1	------	------	19	1	------	------
Ivory Coast (see table below).																	
Jamaica (alastrim)[4]	C	------	------	------	------	------	------	------	2	------	------	------	------	------	------	------	------
Japan: Tokyo	C	------	------	------	1	------	------	------	------	------	------	------	------	------	------	------	------
	D	------	------	------	1	------	------	------	------	------	------	------	------	------	------	------	------
Macao	D	------	2	3	2	1	------	------	------	------	------	------	------	------	------	------	------
Mexico (see also table below):																	
Jalisco (State): Guadalajara	D	9	14	22	20	------	------	6	1	4	------	5	6	3	1	------	------
Juarez	C	2	3	2	------	------	------	------	------	------	------	6	------	------	------	------	------
	D	1	1	------	------	------	------	------	------	------	------	1	------	------	------	------	------
Mexico City and surrounding territory[5]	C	30	38	106	99	30	15	17	18	17	23	20	17	------	------	------	------
	D	7	21	31	47	6	12	8	6	5	4	3	5	------	------	------	------
Morelos State.[4]																	
Progreso	C	------	------	------	------	------	------	1	------	------	------	------	------	------	------	------	------
	D	------	------	------	------	------	------	1	------	------	------	1	------	------	------	------	------
San Luis Potosi	C	------	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------
	D	------	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Morocco (see table below).																	
Nigeria (see also table below): Lagos	C	5	2	1	1	------	------	------	------	------	------	------	1	------	------	------	------
	D	2	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Persia (see table below).																	
Philippine Islands: Sarangani and Balut Islands[6]	D	18	3	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Poland	C	------	2	------	7	------	1	------	2	------	------	------	------	------	------	------	------
Portugal: Lisbon	C	4	7	7	8	6	------	2	------	1	------	2	7	------	7	------	------
Rumania	C	1	1	2	------	------	------	------	------	------	------	------	------	------	------	------	------
Siam	C	------	2	------	8	2	------	------	------	------	------	------	------	------	------	------	------
	D	1	------	------	4	------	------	------	------	------	------	------	------	------	------	------	------
Somaliland, British: Boales	C	35	19	2	------	------	------	------	------	------	------	------	------	------	------	------	------
	D	8	2	6	------	------	------	------	------	------	------	------	------	------	------	------	------
Spain	C	------	------	------	------	------	------	------	------	------	4	------	8	------	1	------	------
Straits Settlements	C	2	------	5	5	1	3	2	5	5	------	1	3	1	2	------	------
	D	1	------	1	2	------	1	1	1	1	------	1	------	1	1	------	------

Sudan (Anglo-Egyptian)	C	230	79	60	42	------	5	13	1	4	8	1	54	8	1	------	3
	D	34	6	5	4	------	------	1	1	------	------	------	3	------	1	------	------
Sudan (French) (see table below).																		
Syria (see table below).																		
Taiwan: Taihoku (see table below).																		
Tunisia: Tunis	C	7	3	3	4	------	1	------	1	------	------	2	------	------	------	------	------
Turkey (see table below).																		
Union of South Africa:																		
Cape Province	C	P	P	P	P	P	P	P	P	------	------	------	------	------	------	------	------
Orange Free State	C	P	P	P	------	------	------	------	------	------	------	------	------	------	------	------	------
Transvaal	C	P	P	P	------	------	------	------	------	------	------	------	------	------	------	------	------
Upper Volta	C	------	26	2	3	------	------	------	1	------	------	------	[5]	------	------	------	------
Zanzibar	C	------	------	13	------	------	------	------	------	------	------	------	------	------	------	------	------
On vessel:																		
S. S. Tairoa, at Liverpool, from London	C	------	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------
S. S. Karagola, at Zanzibar, from India	C	4	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
S. S. Karagola, at Lourenco Marques, from India	C	------	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------
S. S. Elysia, at Port Sudan, from Bombay	C	------	------	------	1	------	------	------	------	------	------	------	------	------	------	------	------
S. S. Naldera, at Port Said	C	------	------	------	------	1	------	------	------	------	------	------	------	------	------	------	------
S. S. Manoa, from Honolulu to San Francisco	C	------	------	------	------	------	------	------	------	------	------	------	1	------	------	------	------

Place		December, 1929	January, 1930	February, 1930	March, 1930			April, 1930			May, 1930			June, 1930	
					1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20
Belgian Congo	C	74	------	------	------	------	------	------	------	------	------	------	------	------	------
	D	4	------	------	------	------	------	------	------	------	------	------	------	------	------
Dahomey	C	19	------	------	------	------	------	------	------	------	------	------	------	------	------
Indo-China (see also table above)	C	142	460	434	------	------	26	261	------	------	------	173	132	80	133
Ivory Coast	C	------	------	------	------	7	------	------	------	------	------	------	------	------	------
Sudan (French)	C	17	229	213	------	200	409	371	------	150	40	56	178	76	------
	D	------	25	11	------	18	31	30	------	6	7	7	18	18	------
Syria: Beirut	C	25	70	18	4	8	5	10	2	7	------	------	7	6	1
Taiwan: Taihoku	C	------	------	43	31	12	15	10	2	------	------	------	------	------	------

Place		December, 1929	January, 1930	February, 1930	March, 1930	April, 1930	May, 1930
British East Africa (see also table above):							
Kenya	C	168	12	12	175	174	------
Uganda	C	------	184	109	------	------	78
	D	------	155	99	------	------	69
Chosen	C	------	1	4	------	5	------
	D	------	------	1	------	1	------
France	C	9	9	23	8	------	3

Place		December, 1929	January, 1930	February, 1930	March, 1930	April, 1930	May, 1930
Mexico: Durango (see also table above)	D	4	12	6	5	4	4
Morocco	C	84	29	74	------	10	18
Nigeria	C	293	------	------	------	------	------
	D	70	------	------	------	------	------
Persia	C	P	------	------	------	------	------
Turkey	C	883	215	114	------	3	16
	D	457	66	42	------	------	------

[3] During the month of March, 1930, 100 cases of smallpox were reported in Mexico City, Mexico, and surrounding territory.
[4] Newspaper reports of Feb. 4 show an epidemic of smallpox in Ionacatepec, Morelos State, Mexico, and vicinity, giving 600 deaths in preceding 2 weeks.
[5] On Feb. 1, 1930, 317 cases of smallpox with 102 deaths were reported to that date in the Sarangani and Balut Islands.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Jan. 12–Feb. 8, 1930	Feb. 9–Mar. 8, 1930	Mar. 9–Apr. 5, 1930	Week ended— April, 1930			May, 1930					June, 1930				July, 1930		
					12	19	26	3	10	17	24	31	7	14	21	28	5	12	19
Algeria:																			
Algiers	C	3	4	6	2	3	2	1	1	2	4	8	2		1				
Constantine Department	C	4	5	11	4	9	2			4		2	11		1				
Oran	C	2										3				4			
Arabia: Aden	C			1															
	D			1															
Bolivia: La Paz.[1]																			
Brazil: Porto Alegre	C		2						1										
Bulgaria	C		13	9	15				1		5		1		9	6		4	
	D		1		1				1		1		1						
Sofia	C	1																	
Chile:																			
Talcahuano	D	1																	
Valparaiso	C	1																	
China:																			
Manchuria—Harbin	C		1	4	5		20	27											
Shanghai	C			1															
Tientsin	C	1																	
Chosen (see table below).																			
Czechoslovakia (see table below).																			
Egypt:																			
Alexandria	C						1								1		1		
Beheira Province	C	14	18	2			2		9	21	9	10	17	16	7	5		5	
	D		5						4	4	4	1	1	1		2		1	
Cairo	C		1																
Port Said	C	2	1																
Suez	C	1																	
Great Britain: Scotland—																			
Dunfermline	C														2			1	
Glasgow	C									1									
	D									1									
Greece (see table below).																			
Iraq: Baghdad Liwa	C			2															
Ireland:																			
Irish Free State—																			
Ballina—Mayo County	C											2		1				1	
Dingle—Kerry County	C						3	2											
Mohill—Leitrim County	C															9			
Shillelagh—Wicklow County	C													1		3	1		
Swinford—Mayo County	C									7	7								

Northern Ireland—Cookstown	C		3																
Latvia (see table below).																			
Lithuania (see table below).																			
Mexico: Mexico City, including municipalities in Federal District	C	12	9	4	2	1		1		2		4	2	3	1	3			
	D	4		1	2	1		1				3		1					
Morocco	C	23	21	38	6	5	3	1	3	6	1	1	1		6	8		4	
	D			7	2	1													
Palestine	C		1	6		1				2			2				3	1	1
Poland	C	296	183	228	59	64	53	67	64	45	34	28			26	37		24	
	D	21	8	13	4	2	3	6	2	2		1			2	3		4	
Portugal:																			
Lisbon	C							4											
Oporto	C		1	2	1														
Rumania	C	241	293	185	71	46		69	60	58									
	D	25	23	12	1	9		1	10	11									
Spain: Valencia	C													2		1		3	
	D																	1	
Tunisia	C		3					2	2	1	1			2	16				
Turkey (see table below).																			
Union of South Africa:																			
Cape Province	C	P	P	P	P	P		P	P	P	P	P					P	P	
Natal	C	1	3	P	P	P	P	P	P			P					P	P	
Orange Free State	C	P	P	P				P	P	P	P						P	P	
Transvaal	C				P	P	P												
Yugoslavia (see table below).																			

Place		January, 1930	February, 1930	March, 1930	April, 1930	May, 1930	June, 1930
Chosen: Seoul	C		17		3		
Czechoslovakia	C	10	2	42	29	12	
France	C						
Greece: Athens	C	12	6	3	1	3	
Latvia	C	18					
Lithuania	C	2	70	62	73	27	16
	D		5	4	4		
Turkey	C	2	3	1	3	16	2
Yugoslavia	C	26	33	46	22	16	6
	D	3	5	2	4	1	

YELLOW FEVER

Brazil:	Cases
Mage, on the Leopoldina Railway, between Rio de Janeiro and Nictheroy, Apr. 22, 1930	2
Campos, Rio de Janeiro Province, May 23, 1930	1
Pdra, June 23, 1930	2
Gold Coast, July 10, 1930	1
Liberia, Monrovia, June 3, 1930	1
Nigeria, Lagos, July 12, 1930 (probably laboratory infection)	1

[1] 12 deaths from typhus fever were reported in La Paz, Bolivia, from Jan. 1 to May 31, 1930.