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AMOEBIC DYSENTERY

PROBLEMS PRESENTED BY THE OUTBREAK IN 1933 *

By G. W. McCox, *Medical Director, United States Public Health Service*

The recent (1933) outbreak of amoebic dysentery, with a total of several hundred cases, which had its origin in Chicago has led to widespread interest in this disease on the part of public health authorities, clinicians, and research workers. The public health officer interests himself in the mode of propagation of the infection and the means of prevention of spread; the clinician is concerned with the diagnosis and treatment of the clinical condition (indeed, early recognition and intelligent treatment yield most gratifying results); and the research worker is concerned with such problems as epidemiology, mechanism of transmission, and the life history of the parasite, *Endamoeba histolytica*, outside the human body. Although various clinicians and special students of the problem have reported in years gone by rather extensive series of cases in different parts of the country, and research workers have shown the widespread prevalence of human carriers of cysts of the parasite, amoebic dysentery generally has not figured largely in medical literature of the United States or as a cause of morbidity or mortality.

The disease has been regarded generally as endemic in certain areas, but as not likely to occur in epidemics. So far as the information at hand goes, the outbreak originating in Chicago in 1933 constitutes the first prevalence that can be regarded as epidemic in a civil community. A reservation must be made with respect to this, however, by pointing out that extensive outbreaks may have occurred in the past without having been attributed to a common source; in other words, there may have been occurrences similar to that which developed in Chicago which did not come to the attention of sanitary authorities because cases of the disorder in various communities were not traced to a definite focus. Dysentery has been known to prevail very extensively in armies in campaigns, but there is not much evidence to show the exact type of this disease that has occurred under these conditions. In the World War, bacillary and amoebic infections occurred side by side in some military units, and occasionally in the same person.

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One of the first questions that arises in the mind of anyone approaching the problem presented by the outbreak which originated in Chicago is whether the disease really is amoebic dysentery. This inquiry is prompted largely by the peculiar epidemiological features presented by the outbreak, which, as already indicated, are unique. Careful consideration of clinical and pathological (gross and microscopic) data leaves one in no doubt that the condition is amoebic dysentery and that all of the manifestations that have been noted in the outbreak fall within the previously recognized variations of the disease. It has been suggested that in this outbreak there is a factor, perhaps a virus or a bacterium, in addition to the admitted role of the *Amoebas*. All that is to be said in this connection at the present time is that the burden of proof rests on those who advance this hypothesis. If later work should develop the fact that some factor in addition to *E. histolytica* is operative, still it would be incumbent to show that such additional factor has not always operated in amoebic dysentery. It long has been recognized that occasionally the *E. histolytica* has been associated with bacteria of the dysentery group, or vice versa, and that it may be difficult, or impossible, to say which manifestations are due to either organism.

We never have had very satisfactory information as to the origin of infection in amoebic dysentery, though certain of the advocates of each of the various possible sources to be mentioned have regarded the matter as settled. The possible sources of infection may be considered to be as follows:

- (1) Infection directly from "carrier" to victim, usually in the preparation or handling of food;
- (2) Contamination of water supplies, local or general;
- (3) Eating of uncooked vegetables from soil that has been fertilized with human excreta.
- (4) Flies.

At present it is best to maintain an open mind on this question and to realize that the source of infection is not necessarily the same in epidemic as in endemic prevalence of the disease. Obviously, fully efficient means of control must await definite information as to the method of spread. If vegetables or water supplies should be found to play the dominant role in the transmission of this disease, prevention is relatively easy.¹ If carriers are the chief source of infection, the problem is not so simple. Surveys in several parts of the world have shown a very high incidence of *Amoeba* infection among food handlers—possibly a significant finding. The inadequacy of methods of detecting *Amoeba* carriers deserves to be mentioned. Several examinations are necessary to be reasonably sure that any given individual is not an *Amoeba* carrier, and no practicable

¹ The prevention of possible transmission by flies may be simple or not, depending on circumstances.

number of examinations will settle this question conclusively. The intermittence of the carrier condition is another factor of uncertainty. The time and effort required for successfully conducting carrier examinations is much greater than is the case in most laboratory procedures, and the expense is correspondingly large. Another difficulty lies in the control of the carriers when they are detected.

There are certain questions that require consideration from the point of view of examinations intended to detect carriers. First of these is whether all carriers are of potential danger to those whose food they might contaminate or to whom the carrier might spread the infection in other ways. One school of protozoologists maintains firmly that all carriers are a menace, while another school holds that pathogenic *Amoebae* may be distinguished from those not pathogenic by readily applied laboratory tests. The second question (and it is one on which there is much difference of opinion) is whether every cyst carrier exhibits clinical or pathological manifestations due to *E. histolytica*.

A feature of the amoebic dysentery problem chiefly of interest to the clinician is the readiness with which the symptoms are mistaken for those of other conditions. This has become very apparent only since the widespread outbreak originating in Chicago first brought cases to the attention of physicians who had not become familiar with the condition through previous experience. Errors in diagnosis spring chiefly from two causes: (a) It does not occur to the practitioner that the condition with which he is dealing may be dysentery, and (b) he may accept too readily as conclusive the negative results of laboratory examinations.

From a study of published and unpublished data, the diagnoses most likely to be made erroneously are appendicitis, colitis, ulcerative colitis, cholecistitis, hepatitis (in cases of amoebic involvement of the liver), malignancy of the intestines, duodenal disease, tuberculosis of the intestine, pleural effusion (in cases of liver abscess), typhoid fever, ulcer of the stomach. That there are very real difficulties in distinguishing some of these conditions is shown by the fact that errors have been made even under conditions most favorable for arriving at a correct diagnosis. A few cases have been submitted to surgical interference. The most frequent situation under which this has occurred has been the erroneous diagnosis of appendicitis. Microscopic or cultural examinations of stool specimens, in connection with efforts to arrive at a diagnosis of amoebic dysentery, need to be interpreted in the light of clinical manifestations, as either a negative or a positive result of the laboratory examinations may be misleading. Stools may be persistently negative in a series of examinations only to have the characteristic organism appear at a later examination, the physician being misled, however, by the results of the earlier

tests. On the other hand, a positive report may be misleading, since an amoebic cyst carrier may be suffering from a condition not related to the presence of the protozoa in his stool. In the light of recent experience it seems fair to say that the practitioner should exercise care in the interpretation of results of laboratory tests. He will be likely to avoid error by relying on his judgment of clinical manifestations rather than by depending too implicitly on reports of laboratory tests.

These considerations of this phase of the subject are entirely apart from the matter of the reliability of laboratory reports. Laboratory workers of even modest experience in the recognition of intestinal protozoa should have no difficulty in detecting the vegetative forms of *E. histolytica*, the forms most important in dealing with amoebic dysentery, since the presence of red blood cells within the parasite and the rather characteristic motility readily permit a diagnosis. The cysts are not so readily differentiated and even the experienced worker may be in doubt as to a given specimen.

The problem of the prevention of amoebic dysentery, as it presents itself to the administrative health officer, is not susceptible of ready solution. More information is needed before wholly satisfactory measures can be inaugurated. Perhaps the first suggestion will be the detection, by stool examinations, of *Amoeba* carriers among food handlers in general and the elimination of the carriers from the food-handling groups. The difficulties encountered here have already been mentioned. While this procedure may be inapplicable to all food handlers, it doubtless will serve a useful purpose in special circumstances, such as in instances where suspicion points to a particular group as a probable source of infection.

It has been suggested that the education of food handlers in personal hygiene would constitute a valuable means of prevention of spread of the infection. The measure suggested is careful cleansing of the hands, or even disinfection by chemicals, on coming on duty and after each visit to the toilet. It remains to be seen whether any considerable number of individuals can be made sufficiently conscious of the possible menace to others to render this measure effective.

On account of the high incidence of *Amoeba* carriers among food handlers, treatment with amoebicides of all members of food-handler groups has been suggested; but this does not seem advisable in the present stage of our knowledge. The necessity for medical treatment of recognizable clinical cases, even though mild, among food handlers or others, is obvious.

GAS HAZARDS IN SEWERS AND SEWAGE-TREATMENT PLANTS¹

By R. R. SAYERS, *Surgeon, in charge Office of Industrial Hygiene and Sanitation,
United States Public Health Service*

Gas hazards in sewers and sewage-treatment plants are those due to inflammable and poisonous gases and to oxygen deficiency. Inflammable and poisonous gases may be derived from three general sources: Low volatile liquids which enter as part of the sewage, leakage from gas mains into the sewers, or the products of fermentation or digestion of sewage.

The inflammable or poisonous gases usually found in treatment plants are methane, hydrogen, carbon dioxide, and possibly carbon monoxide and hydrogen sulphide. Mr. G. W. Jones, chemist, Pittsburgh Experiment Station, United States Bureau of Mines, has summarized the composition and inflammable limits of gases from sewage sludge digestion tanks,² and his summary is presented in the accompanying table.

TABLE 1.—*Composition and inflammable limits (in percent) of gases from sewage sludge digestion tanks*

Source.....	Imhoff tank		Septic tank		Imhoff tanks				Imhoff tank				Range
					Foaming		Non-foaming		Lower compartment		Upper compartment		
Sample number.....	a	b	c		d	e	f	g	h	i	j	k	
Reference.....	(1)	(1)	(2)	(2)	(2)	(2)	(2)	(2)	(3)	(3)	(3)	(3)	
Carbon dioxide.....	4.4	5.2	13.6	17.0	19.8	29.4	3.3	28.5	11.8	9.6	20.0	23.4	3.3-29.4
Oxygen.....	0.6	0.5	0.0	0.0	0.3	0.0	0.0	0.0	1.2	1.0	-----	-----	0.0-1.2
Hydrogen sulphide.....	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	-----	-----	0.0-0.1
Hydrogen.....	7.9	8.2	3.5	0.0	0.0	0.0	0.0	0.0	4.6	0.0	1.8	1.7	0.0-8.2
Methane.....	84.2	82.8	72.5	78.0	68.7	66.6	78.2	63.0	70.2	66.1	70.0	67.5	63.0-84.2
Nitrogen.....	2.9	3.3	10.4	5.0	11.2	3.9	18.5	8.5	12.2	23.3	8.2	7.4	2.9-23.3
Inflammable limit:													
Lower.....	5.30	5.30	6.55	6.70	7.40	7.80	6.40	8.30	6.55	7.80	7.55	7.80	5.30-8.30
Upper.....	16.00	16.10	17.90	16.65	13.25	13.35	16.85	19.15	18.45	19.25	13.45	18.50	16.00-19.25

References: (1) Gas from Imhoff Tank. By C. C. Mommon. *Eng. News*, 71, 1914, p. 760. (2) Some Observations on Sewage Tank Gases. By A. M. Buswell and S. I. Strickhouser. *Ind. Eng. Chem.*, 18, 1926, p. 407. (3) Results of Sewage Treatment. By H. E. Babbitt and H. E. Schlenz. *Univ. Illinois Bull.* no. 198, 1929, pp. 88 and 92.

The tabulation gives the analyses of typical sewage gases. It will be noted from a study of this table that the oxygen varies from 0 to 1.2 percent, carbon dioxide from 3 to 30 percent, hydrogen sulphide from 0 to 0.1 percent, hydrogen from 0 to 8.2 percent, methane from 63 to 84.2 percent. Jones calls attention especially to the explosion hazards and gives four factors as essential.

¹ Presented before the Illinois Society of Engineers, at Chicago, Jan. 23, 1933.

Jones, G. W.: *Explosion and Health Hazards in Sewage Works Operation.* 1933.

Katz, in his paper on Gas Hazards in Street Manholes,³ states that the following are the principal gases found:

Poisonous and explosive gases found in manholes

<i>Gas</i>	<i>Source</i>
Ammonia, explosive.....	Refrigerating plants.
Benzol, explosive.....	Motor vehicles, storage tanks.
Carbon dioxide, nonexplosive.....	Products of combustion, sewer gas.
Carbon monoxide, explosive.....	Manufactured fuel gas, flue gas, products of combustion, exhaust gas from motors.
Ethane, explosive.....	Natural gas, manufactured fuel gas.
Gasoline, explosive.....	Motor vehicles, storage tanks.
Hydrogen, explosive.....	Artificial fuel gases, electrolysis of water.
Hydrogen sulphide, explosive.....	Sewer gas, coal gas.
Methane, explosive.....	Natural gas, manufactured gas, sewer gas.
Sulphur dioxide, nonexplosive.....	Burning insulation.
Unsaturated hydrocarbons, explosive..	Manufactured fuel gases.

It will be noted that only a few of the gases mentioned by Katz come from sewage itself. It will be noted also that a number of those gases are both explosive and toxic. This applies to all but methane, ethane, hydrogen, and carbon dioxide, although carbon dioxide is of low toxicity. Carbon monoxide is the poisonous gas most frequently found in manholes and may occasionally occur in treatment plants. Although reported by Hallé⁴ as early as 1785 as having caused deaths due to gases from sewers in Paris, according to Katz hydrogen sulphide has not been found in manholes in dangerous concentrations and it probably does not occur in dangerous concentrations in treatment plants.

PROPERTIES OF GASES FOUND IN SEWERS AND TREATMENT PLANTS⁵

AMMONIA, NH₃

Inflammable limits in percentage by volume: Lower, 16; upper, 27.

Boiling point, -35.5° C.

Percentage causing dangerous illness in ½ to 1 hour, 0.25 to 0.45.

Percentage that can be borne without severe effects for ½ to 1 hour, 0.03.

Maximum safe concentration, 0.01 percent.

Ammonia is a colorless gas of sharply penetrating odor. The symptoms of poisoning are acute inflammation of the respiratory organs, cough, edema of the lungs, chronic bronchial catarrh, redness of the eyes, increased secretion of saliva, and retention of urine.

³ Katz, S. H., Meiter, E. G., and Bloomfield, J. J.: Gas Hazards in Street Manholes. Report of Investigations, Serial No. 2710, U.S. Bureau of Mines, October 1925. 20 pp.

⁴ Hallé, M.: Recherches sur une espèce de méphitisme des fosses d'aisance. 1785.

⁵ Unless otherwise indicated, the inflammable limits of the various gases are taken from Bureau of Mines Bulletin No. 279, Limits of Inflammability of Gases and Vapors, 1931, and the toxic limits from International Critical Tables, vol. II, 1927, pp. 318-320.

BENZOL, C₆H₆

Inflammable limits in percentage by volume: Lower, 1.4; upper, 8.

Boiling point, 80.2° C.

Percentage that can be borne without severe effects for ½ to 1 hour, 0.31 to 0.47.

Maximum safe concentration, 0.15 to 0.31 percent.

Benzol is an extremely volatile, colorless fluid. As a vapor it enters the body through the respiratory organs and by reabsorption through the skin. Symptoms of poisoning are headache, vertigo, anemia, muscular tremor, scarlet lips, spots of extravasated blood in the skin, irritant cough, and fatty degeneration of the liver, kidneys, and heart.

CARBON DIOXIDE, CO₂

Boiling point, -78.2° C.

Percentage fatal in 30 minutes or less, 30.

Percentage causing dangerous illness in ½ to 1 hour, 6 to 8.

Percentage that can be borne without severe effects for ½ to 1 hour, 4 to 6.

Maximum safe concentration, 2 to 3 percent.

Carbon dioxide affects the respiratory rate according to its concentration in the air. It has been found that men can breathe air containing many times the amount of carbon dioxide found in our worst ventilated theaters and assembly halls, which, according to Rosenau, do not contain above 0.5 percent carbon dioxide. One half of 1 percent of carbon dioxide in normal air causes a slight and unnoticeable increase in the ventilation of the lungs; that is, a man exposed to one half of 1 percent of carbon dioxide will breathe a little deeper and a little faster than when in pure air. With 2 percent of carbon dioxide in the air the lung ventilation will be increased about 50 percent; with 3 percent to about 100 percent; with 5 percent to about 300 percent, and the breathing will be laborious; and 10 percent cannot be endured for more than a very few minutes. According to Sollmann, if oxygen deficiency is excluded by inhaling gas mixtures containing 20 percent of oxygen, no effects occur until the concentration of 3 percent by volume of carbon dioxide is reached. With this concentration there is some hyperpnea and discomfort; 8½ percent produces in a few minutes distinct dyspnea, rise of blood pressure, and congestion which become insupportable in 15 or 20 minutes; but these symptoms disappear promptly in fresh air. The symptoms increase with 15 percent, but even 20 percent is not dangerous in an hour to animals and probably not to man. With 25 to 30 percent the stimulant phenomena pass into depression, with diminished respiration, fall of blood pressure, coma (generally without convulsions), loss of reflexes, anesthesia, and gradual death after some hours, the heart outlasting the respiration. With higher concentrations, the stimulation is still briefer. With pure carbon dioxide, death may

occur in a few minutes as a mixed effect of carbon dioxide and anoxemia.

The air in manholes and sewage-treatment plants may be deficient in oxygen owing to the oxidation of organic material or to dilution by inert gases from outside sources, such as natural gas (methane). Although oxygen is not usually considered toxic or noxious, a variation in its concentration cannot be neglected, as untoward effects develop if the variation is marked. Man is so made that he breathes easily and works best when the air contains about 21 percent of oxygen, the amount usually in air; but he is able to live and work, although not so well when there is less oxygen. When about 17 percent of the air is oxygen, a man at work will breathe a little faster and a little deeper, about the same as when he first goes from sea level to a height of 5,000 feet. Men breathing air that has as little as 15 percent of oxygen usually become dizzy, notice a buzzing in the ear, have a rapid heartbeat, and often suffer from headache. Very few men are free from these symptoms when the oxygen in the air falls to 10 percent. Haldane, the English physiologist, says that under certain conditions men may be conscious even with as little as 3½ percent of oxygen in the air they are breathing. However, under other conditions men faint or become unconscious when the air contains 9 percent of oxygen or more.

ETHANE, C₂H₆

Boiling point, -93° C.

Inflammable limits in percentage by volume: Lower, 3.2; upper, 12.5.

METHANE, CH₄

Boiling point, -164° C.

Inflammable limits in percentage by volume: Lower, 5.0; upper, 15.

Ethane and methane, or natural gas, may be present. Their importance is not due to physiological or noxious action, but to the fact that they form explosive mixtures with the oxygen of the air, and this may result in disaster. Furthermore, the methane may dilute the oxygen of the air to such an extent as to produce the effects of low oxygen mentioned above.

GASOLINE, C₆H₁₄ TO C₇H₁₆⁶

Inflammable limits in percentage by volume: Lower, 1.4; upper, 6.

Boiling point (boiling range), 50° to 140° C.

Percentage causing dangerous illness in ½ to 1 hour, 2.0 to 2.5.

Percentage that can be borne without severe effects for ½ to 1 hour, 0.1 to 0.3.

Maximum safe concentration, 0.1 percent.

Gasoline vapors, when inhaled, cause headache, nausea, delirium, vertigo, and unconsciousness. Burning pains in the chest and irrita-

⁶ The toxic limits for gasoline are taken from Bureau of Mines Technical Paper 272, Permeation of Oxygen Breathing Apparatus by Gases and Vapors. 1921.

tion which cause coughing are experienced when the concentration is moderately high—0.7 percent. In some studies carried out by the Bureau of Mines it was found that exposure of men to 0.1 percent of gasoline vapor caused dullness, unsteadiness, and giddiness in 50 minutes; 0.3 percent caused slight irritation of the eyes and moderate symptoms of dizziness in 30 minutes; and 0.7 percent caused coughing, marked irritation of the eyes and nose, numbness of the legs, and unsteadiness in 10 minutes; 1 percent is about the maximum concentration that a man can stand, owing to the irritating effect on the skin as well as on the mucous membrane. The above symptoms were observed in men who had not been exposed to gasoline fumes in such concentrations regularly before the experiments were carried out. Tolerance to gasoline develops to some extent after repeated exposures. In some studies conducted by Mr. A. C. Fieldner, it was found that 2 to 2.5 percent gasoline vapor, when breathed, even though the body was unexposed, rendered a man dizzy and soon became intolerable.

In a study carried out by Dr. Howard W. Haggard for the Bureau of Mines, unconsciousness occurred in dogs when exposed to slightly more than 1.5 percent concentration, signs of discomfort appeared at about 0.8 percent, convulsions usually occurred at about 1 percent, complete surgical anesthesia at about 2.3 percent, and death at about 2.4 percent.

HYDROGEN SULPHIDE, H₂S

Inflammable limits in percentage by volume: Lower, 4.3; upper, 46.

Boiling point, -60.2° C.

Percentage fatal in 30 minutes or less, 0.06 to 0.1.

Percentage causing dangerous illness in $\frac{1}{2}$ to 1 hour, 0.05 to 0.07.

Percentage that can be borne without severe effects for $\frac{1}{2}$ to 1 hour, 0.02 to 0.03.

Maximum safe concentration, 0.005 to 0.01 percent.

Hydrogen sulphide has a very repulsive odor in low concentrations that may serve as a warning. Its presence in sewers and treatment plants has been attributed to the decomposition of sewage. Its toxicity is comparable to that of hydrogen cyanide.

Poisoning by hydrogen sulphide is of two types, namely, acute and subacute, causing asphyxiation and irritation (conjunctivitis, bronchitis, pharyngitis, and depression of the central nervous system), respectively. Death from asphyxia is caused by paralysis of the respiratory center, while death from subacute poisoning is associated with edema of the lungs. The exact low limit of hydrogen sulphide concentration at which it ceases to act as a poison has not as yet been determined, but is evidently below 0.005 percent; 0.06 to 0.1 percent is sufficient to cause serious symptoms within a few minutes.

In low concentrations hydrogen sulphide produces symptoms of headache, sleeplessness, dullness, dizziness, and weariness. Pain in the eyes, followed by conjunctivitis, is fairly constant, while bron-

chitis and pains in the chest are frequent. Further poisoning produces depression, stupor, unconsciousness, and death. The heart continues to beat after respiration has ceased.

SULPHUR DIOXIDE, SO_2

Boiling point, -10°C .

Percentage fatal in 30 minutes or less, 0.2.

Maximum safe concentration, 0.01 percent.

Sulphur dioxide has a pungent odor and suffocating effect. It usually comes from the burning of insulation containing sulphur. It is very irritating to the eyes and respiratory passages, 1 part in 500 being almost intolerable to breathe; there is occasionally sufficient concentration in the atmosphere to be dangerous. It is easily recognized by its characteristic odor, and it causes choking when breathed, as do fumes from burning sulphur. Symptoms of poisoning are spasmodic cough, bronchial catarrh, digestive disturbances, and blood-tinged mucous.

CARBON MONOXIDE, CO

Inflammable limits in percentage by volume: Lower, 12.5; upper, 74.

Boiling point, -192°C .

Percentage fatal in 30 minutes or less, 0.5 to 1.0.

Percentage causing dangerous illness in $\frac{1}{2}$ to 1 hour, 0.2 to 0.3.

Percentage that can be borne without severe effects for $\frac{1}{2}$ to 1 hour, 0.05 to 0.1.

Maximum safe concentration for long exposures, 0.02 percent.

Carbon monoxide is a colorless, tasteless gas, and odorless in diffused state. It burns with a blue flame in air. It exerts its extremely dangerous action on the body by displacing the oxygen from combination with the hemoglobin. Hemoglobin, the coloring matter of the blood, normally absorbs oxygen from the air and delivers it to the tissues through the blood. The affinity of carbon monoxide for hemoglobin is about 300 times that of oxygen. Because of this, even when only a small amount of the poisonous gas is present in the air breathed into the lungs, much of the hemoglobin is locked up in combination with carbon monoxide and so cannot keep up its usual work of carrying oxygen to the tissues. These, because of lack of oxygen, cannot do their work properly. If they are smothered long enough, the tissue cells become damaged, and the injury to the cells may be permanent even if the patient survives.

With increasing concentrations of carbon monoxide, the time required for a given amount of hemoglobin to combine with carbon monoxide decreases very rapidly, until with 1 percent concentration it may require only time enough to take a few breaths to produce a saturation of 60 to 80 percent, which may be fatal.

The symptoms of carbon-monoxide poisoning may be divided into two stages, the first covering the period beginning with normal and

ending in syncope, and the second a depression of the central nervous system beginning in syncope, extending through coma, and ending in apnea.

Stage 1. Tightness across forehead, dilatation of cutaneous vessels, headache (frontal and basal), throbbing in temples, weariness, weakness, dizziness, nausea and vomiting, loss of strength and muscular control, increased pulse and respiratory rates, collapse. All of these effects are greatly increased and accelerated with exercise, because of the additional need of oxygen in the tissues. Men at rest have often been exposed to carbon monoxide all day without noticing any marked ill effects, but on walking home or exercising have experienced severe symptoms, even to unconsciousness.

It is seldom that all of these symptoms are experienced by the same individual. Also, in some cases the poisoning may proceed to the stage of syncope without the victim's feeling any of the subjective symptoms. This frequently occurs when the poisoning has been rapid.

Stage 2. Increased pulse and respiratory rates, fall of blood pressure, loss of muscular control, especially sphincters, loss of reflexes, coma, usually with intermittent convulsions, Cheyne-Stokes' respiration, slowing of pulse, respiration slow and shallow, cessation of respiration, death.

With a given blood saturation the character and severity of symptoms acquired during exposure depend upon the time required to attain that saturation and the degree of muscular activity—in other words, the extent of oxygen deprivation. The number of symptoms decreases with the rate of saturation. With high concentrations the victim may experience but few (weakness and dizziness) of those symptoms given under stage 1. If a given saturation has been acquired by a long exposure to a low concentration, the symptoms and after-effects will be a great deal more severe than if the same saturation has been acquired by a short exposure to a high concentration. Muscular activity increases the number and accentuates the character of the symptoms during exposure, and will bring out latent symptoms after exposure. A person at rest may pass into a state of dizziness and unconsciousness without experiencing any marked previous effects.

PREVENTION OF POISONING BY GASES FOUND IN SEWERS AND TREATMENT PLANTS

The National Electrical Safety Code states that a manhole should never be entered "until you have assured yourself that it is free from dangerous gases, by testing with an approved safety lamp, by ventilation, or by other adequate methods." Tests may be made to determine the presence of poisonous or explosive gases. Odors are

important indicators of the presence of many such gases. However, some of them have little or no odor, such as carbon monoxide and hydrogen. Inflammable gases may be detected by the Burrell methane indicator, the Martienssen methane detector, and the U. C. C. methane detector.

Deficiency in oxygen and the presence of poisonous gases may be detected by the use of small animals, especially birds. Canaries have been found to be best of the live detectors, as they usually show symptoms of distress sooner than other small animals. Yant⁷ found that Japanese waltzing mice were of value for this purpose. This same investigator⁸ also called attention to the defects of a flame safety lamp for the detection of gasoline fumes, and it would, therefore, not be universally suitable for the detection of gases in sewers and possibly not in sewage-treatment plants. A portable apparatus⁹ has been developed which will indicate whether an atmosphere is explosive above the explosive limit, deficient in oxygen, or, if below the explosive limit, the approximate percentage of combustibles present. The apparatus is operated, however, so as to give an analysis showing the percentage of the various gases, such as carbon dioxide, oxygen, ethylene, carbon monoxide, hydrogen, methane plus ethane, and nitrogen. This apparatus would not necessarily indicate the toxic properties of the atmosphere. Satisfactory apparatus has been developed especially for detecting small quantities of carbon monoxide, such as the iodine pentoxide indicator, pyrotannic acid apparatus, and palladium chloride ampoules or paper.

Jones (see footnote 2) recommends that sewage tanks be well ventilated before workmen are allowed to enter them for making inspection or repairs. This reason is evident, as the lower inflammable limit may be reached when the concentration of sewage gas is about 5 percent. (See table 1.) There are several types of portable blowers with explosion-proof motors which may be used satisfactorily for ventilating sewage tanks before making inspection or repairs. Jones strongly emphasizes that the ventilation should be continued during the time the workmen are in the tanks, as gases are given off and may reach the lower inflammable limit unless continuously diluted with air. Jones makes the following additional recommendations:

“(1) If illumination is required in the tanks, only flashlights approved by the Bureau of Mines should be used.

“(2) At many sewage-disposal plants the gases are collected and used for heating purposes. The utilization of these gases is attended

⁷ Yant, W. P., Patty, F. A., Schrenk, H. H., and Berger, L. B.: The Response of Japanese Waltzing Mice and Canaries to Carbon Monoxide and to Atmospheres Deficient in Oxygen. R.I. 3040, U.S. Bureau of Mines, Oct., 1930, 12 pp.

⁸ Yant, W. P., Berber, L. B., and McCaa, G. S.: A New Flame Safety-Lamp Testing and Demonstration Apparatus. R.I. 3017, U.S. Bureau of Mines, July, 1930, 10 pp.

⁹ Jones, G. W. and Perrott, G. St. J.: Gases in Manholes: A Survey of a Utility in Boston, Mass. R.I. 3109, U.S. Bureau of Mines, May, 1931, 16 pp.

with some hazards. Very little trouble should be experienced when the plant is in continuous operation, because the pure gas contains very little oxygen and should be as safe to use as ordinary manufactured gas. However, if the plant is shut down or gas generation stopped, then air may leak into the distribution system and thus produce explosive mixtures.

"Of chief importance to prevent the infiltration of air is to keep the entire system under a few inches of water pressure so that leakage will be from the system rather than into it. If air can be kept out of the system then explosions will not be possible.

"Even under the best operating conditions there may be times when the system will contain some air, especially when first put into operation. Then precautions must be taken to prevent flames from traveling through the distribution mains and causing bad explosions. Sir Humphrey Davy, over a hundred years ago, discovered that fine meshed screens placed around the flame of a miner's lamp would prevent the flame on the inside of the lamp from igniting explosive mixtures of methane in air on the outside. Since that time many uses have been made of this discovery, more especially the arresting of the flames in pipe lines. Personally, I think the safety features claimed for screens in systems containing large volumes of gas have been overrated. They are excellent protection for 'stationary' flames as found in a safety lamp or even for flames moving at a slow speed; but for flames given a sufficient length of travel, which in pipes of sufficient size may travel 1,000 feet a second and develop high pressures, several screens in tandem will be required, and even then if the flame has been arrested the high pressure is still present and must be eliminated if damage to the flame trap is to be prevented. Our experience gained last year on another problem, whereby means of preventing damage to industrial equipment from explosive mixtures were investigated, led to the conclusion that release diaphragms are the most satisfactory method of protecting systems containing explosive mixtures. Release diaphragms properly placed and of the right size augmented by water seals and screens should give satisfactory protection to sewage-gas systems. On account of a lack of information on the flame speeds and pressures developed when explosive mixtures of sewage gases are ignited in pipes or other chambers, it is not possible to state definitely how and where the diaphragms should be placed. Information on other explosive mixtures in general permits us to reason by analogy what might be adequate for sewage gases. I might say as a mere speculation that, if release diaphragm openings are installed on the flame trap of a sewage pipe system so that there are 3.5 square feet of release opening per 100 cubic feet of gas, the release opening be 6 inches or larger in diameter, aluminum, lead, or tin foil be used for diaphragm mate-

rial and not over 0.002 inch in thickness, then the pressure in the flame trap caused by the explosion of any sewage gas-air mixture should not exceed 12 pounds per square inch above atmospheric pressure. The installation of two flame traps close together and at the delivery end of the sewage gases, so assembled that the traps may be connected in series or parallel, and each equipped with the proper diaphragm releases, water seals, and screens, should safely prevent flames from traveling through the piping system to the sewage tanks. The traps should be equipped with suitable gauges to give the pressure of the gas in the traps and height of the water above the water seals.

"Two flame traps are recommended so that in case of trouble in either the gas may be passed through one while the other is being cleaned. During normal operation both may be used as an added protection.

"It is very important that the water in the seals should be kept at the proper height at all times and screens kept clean, the flame traps be placed in a heated and well ventilated part of the building and protected by an enclosure so the diaphragms are not damaged and that employees may not be burned by flames issuing through the diaphragm openings should an explosion occur."

If it is necessary to enter an atmosphere containing any of the above noxious gases with insufficient ventilation, Katz¹⁰ has recommended the hosemask, especially for manholes. The type N canister mask is also satisfactory when the air contains only a small proportion of poisonous gases and sufficient oxygen to support life. The hose-mask has the advantage that there is nothing to be changed until the parts become worn out. It may be used to a distance of 100 feet. Longer hose, however, is not usually practicable. The hosemask with a hand-operated rotary blower delivers the air at the face piece in excess of that necessary to be breathed. It further has the advantage that, should the hose leak, the leak will be outward rather than into the hose. It is obvious that the intake end of the hosemask should be in fresh air.

TREATMENT OF POISONING BY GASES FOUND IN SEWERS AND TREATMENT PLANTS

The steps in effective treatment of acute poisoning by poisonous and noxious gases in sewers and treatment plants are as follows:

1. The victim should be removed to fresh air as soon as possible.
2. If breathing has stopped, or is weak and intermittent, or present in but occasional gasps, artificial respiration by the Schaefer method should be given persistently until normal breathing is resumed, or until after the heart has stopped.

¹⁰ See footnote 3.

3. Circulation should be aided by rubbing the limbs and keeping the body warm with blankets, hot-water bottles, hot bricks or other devices, care being taken that these are wrapped or do not come in contact with the body and produce burns. This aids in tiding the body over a period of low vitality. Other stimulants, such as hypodermics of caffeine, sodium benzoate, or camphor in oil, should not be administered except by a doctor after he has considered the possibility of overstimulation and consequent collapse.

4. The patient should be kept at rest, lying down in order to avoid any strain on the heart. Later, he should be treated as a convalescent and given plenty of time to rest and recuperate.

5. After-effects of poisoning by such gases should be treated symptomatically.

6. It should be emphasized that inhalation, for a period of 20 to 30 minutes, of oxygen, or a 5 percent mixture of carbon dioxide in oxygen if available, will, when given immediately, greatly lessen the number and severity of symptoms of carbon monoxide poisoning, as well as decrease the possibility of serious sequelae. All industries in which this type of poisoning commonly exists should provide apparatus (inhalers) for the efficient administration of these treatments. This apparatus should be placed at points most convenient for treating carbon monoxide poisoning, and employees should be trained in its use so that resuscitation may be effected immediately.

CITY HEALTH OFFICERS, 1933

Directory of Those in Cities of 10,000 or More Population

Directories of the city health officers in the cities of the United States having a population of 10,000 or more have been published in the Public Health Reports¹ for each year from 1916 to 1931 for the information of health officers and others interested in public-health activities. These directories have been compiled from data furnished by the health officers. The cities included in this directory are those having populations of 10,000 or more according to the 1930 census.

The asterisk (*) indicates that the officer before whose name it appears has been reported to be a "whole-time" health officer. For this purpose a "whole-time" officer is defined as "one who does not engage in the practice of medicine or in any other business, but devotes all his time to official duties."

¹ Reprints nos. 346, 416, 494, 539, 599, 702, 767, 876, 930, 1025, 1103, 1177, 1257, 1333, 1426, and 1521 from the Public Health Reports.

City	Name of health officer	Official title
Alabama:		
Anniston.....	*George A. Cryer, M.D.....	County health officer.
Bessamer.....	*J. D. Dowling, M.D.....	Do.
Birmingham.....	*J. D. Dowling, M.D.....	Do.
Decatur.....	*Lee Roy Murphree, M.D., C.P.H.....	Do.
Dothan.....	*F. G. Granger, M.D.....	Do.
Fairfield.....		
Florence.....	*W. D. Hubbard, M.D.....	Do.
Gadsden.....	*C. L. Murphree.....	Do.
Huntsville.....	*W. C. Hatchett, M.D.....	Do.
Mobile.....	*C. A. Mohr, M.D.....	Do.
Montgomery.....	*J. L. Bowman, M.D.....	Do.
Phenix.....		
Selma.....	*L. T. Lee, M.D.....	Do.
Tuscaloosa.....	*A. A. Kirk, M.D.....	Do.
Arizona:		
Phoenix.....	George E. Shields, M.D.....	City health officer.
Tucson.....	*Lewis H. Howard, M.D.....	Director, health unit.
Arkansas:		
Blytheville.....	I. R. Johnson, M.D.....	City health officer.
El Dorado.....	F. O. Mahony, M.D.....	Do.
Fort Smith.....	*J. E. Johnson, M.D.....	District health officer.
Hot Springs.....	*James Foster Merritt, M.D.....	City and county health officer.
Jonesboro.....	Ralph M. Sloan, M.D.....	City health officer.
Little Rock.....	V. T. Webb, M. D.....	Do.
North Little Rock.....	Val L. Eason, M.D., D.P.H.....	Do.
Pine Bluff.....		
Texarkana.....	Harry Eldridge Murry, M.D.....	Do.
California:		
Alameda.....	Francis B. Galbraith, M.D.....	Health officer and city physician.
Alhambra ¹	*S. J. Stewart, M.D.....	District health officer.
Anaheim.....	*K. H. Sutherland, M.D.....	Orange County health officer.
Bakersfield.....	P. J. Cuneo, M.D.....	Health officer.
Berkeley.....	*Frank L. Kelly, M.D., Dr. P.H.....	Health officer and local registrar.
Beverly Hills.....	Charles Frederick Nelson, M.D.....	Health officer.
Brawley.....	John L. Parker, M.D.....	Do.
Burbank.....	Thomas H. Ransom, M.D.....	Do.
Burlingame.....	Matthew F. Desmond, M.D.....	Do.
Compton ¹	*J. L. Pomeroy, M.D.....	County health officer.
Eureka.....	W. J. Quinn, M.D.....	Health officer.
Fresno.....	C. Mathewson, M.D.....	Do.
Fullerton.....	*K. H. Sutherland, M.D.....	Orange County health officer.
Glendale ¹	*F. A. Wilmot, M.D., D.P.H.....	District health officer.
Huntington Park ¹	*George M. Malkin, M.D.....	Do.
Inglewood ¹		
Long Beach.....	*Grundy E. McDonald, M.D.....	City health officer.
Los Angeles.....	*Charles W. Decker, M.D.....	Health officer.
	*George M. Stevens, M.D.....	Epidemiologist and first assistant health officer.
	Divisional directors:	
	*Chas. G. Wharton, M.D.....	Second assistant health officer.
	*Louis J. Petritz, M.D.....	Assistant health officer and director of inspections.
	*Harry Cohn, M.D.....	Director of tuberculosis.
	*Agnes M. Talcott.....	Director of nurses.
	*C. B. Leasure.....	Chief clerk.
	*F. W. Peterson.....	Director of vital statistics.
	*John Carman.....	Chief chemist.
	*Mona Bettin, M.D.....	Chief bacteriologist.
	*F. D. Sweger.....	Director of housing and sanitation.
	*William Veit, D.V.M.....	Director of milk and meat inspection.
	*A. M. Rogers, M.D.....	Director, venereal clinic (male).
	*Emily F. Balcom, M.D.....	Director, venereal clinic (female).
	*Lyle McNeile, M.D.....	Director, maternity division.
	*C. K. Stewart.....	Director of rodent division.
	*J. M. Cain.....	Director of quarantine and morbidity divisions.
	*L. V. Dieter, D. of Phar.....	Director of laboratories.
	*W. E. Hopkins, D.V.....	Chief, meat inspection division.
	*Lillian Kositz, M.D.....	Director, child hygiene division.
Modesto.....	*E. F. Reamer, M.D.....	Stanislaus County health officer.
Monrovia ¹	*J. M. Furstman, M.D.....	District health officer.
Oakland.....	*A. Hieronymus, M.D.....	Health officer.
Ontario.....	Calvert L. Emmons, M.D.....	City health officer.
Palo Alto.....	*Louis Olsen, S.E.....	Health officer.
Pasadena.....	*J. D. Dunshee, M.D.....	Do.
Pomona ¹	*M. U. Stoneman, M.D.....	District health officer.
Redlands.....	Harold G. Gentry, M.D.....	Secretary, board of health.
Richmond.....	Charles Robert Blake, M.D.....	Commissioner of health.
Riverside.....	*William B. Wells, M.D.....	Do.
Sacramento.....	*Herbert F. True, M.D.....	City health officer.
Salinas.....	*Marie K. Fidel, R.N.....	Do.

¹ Under supervision of Dr. J. L. Pomeroy, health officer of Los Angeles County, Hall of Justice, Los Angeles, Calif.

City	Name of health officer	Official title
California—Continued.		
San Bernardino.....	Walter D. Lenker, M.D.....	City health officer.
San Diego.....	*Alex M. Lesem, M.D.....	Director of health.
San Francisco:	Health advisory board:	
Department of public	Laurence Arnstein, Chairman.	
health—	Howard Adler, M. D.	
	Frank J. Ellimm.	
	T. J. Lenehan.	
	F. H. McKavitt, D.D.S.	
	J. W. Ward, M.D.	
	W. W. Wymore, M.D.	
	*J. C. Geiger, M.D.....	Director of public health.
	*Jacques P. Gray, M.D.....	Assistant director of public health.
	G. M. Wollenberg.....	Director of institutions—Superintendent, Laguna Honda Home.
	L. M. Wilbor, M.D.....	Superintendent, San Francisco Hospital.
	Myra W. Kimball.....	Superintendent, Hassler Health Home.
	Edmund Butler, M.D.....	Chief surgeon, Emergency Hospital Service.
	George K. Rhodes, M.D.....	Assistant chief surgeon, Emergency Hospital Service.
	James I. O'Dea.....	Chief steward, Emergency Hospital Service.
	P. R. Hennessy.....	Senior accountant.
	Ed. M. Coffey.....	Chief clerk.
	George H. Becker, M.D.....	Director, bureau of communicable diseases.
	R. W. Burlingame, M.D.....	Resident physician, isolation division, San Francisco Hospital, and director division of venereal disease control.
	W. R. P. Clark, M.D.....	Director, division of tuberculosis control.
	Paul S. Barrett, M.D.....	Director, bureau of child hygiene.
	Ernestine Schwab.....	Director of field nursing.
	R. Grosso, D. D. S.	Chief dental surgeon.
	Olga Bridgman, M.D.....	Chief, division of mental hygiene.
	T. P. Lydon.....	Director, bureau of food and milk.
	J. J. Burke.....	Chief, food inspection.
	B. Q. Engle.....	Chief, pasteurizing plant inspection.
	C. G. Hansen.....	Chief, meat and market inspection.
	G. A. Melody, D.V.M.....	Chief, dairy inspection.
	A. B. Crowley.....	Chief, industrial hygiene division.
	H. P. Thyle.....	Chief, housing inspection division.
	W. D. Hobro.....	Chief, plumbing inspection division.
	Annie D. MacRae, M.D.....	Director of laboratories.
	Clinton Davis.....	Chief chemist.
	*Henry C. Brown, M.D.....	Health officer.
	Luther Michael, M.D.....	City health officer.
	W. C. McLean, D.V.M.....	Health officer.
	*K. H. Sutherland, M.D.....	Orange County health officer.
	*William H. Eaton, M.D.....	Health officer.
	John T. Harrington, M.D.....	City health officer.
	*Wm. F. Reasner, M.D.....	District health officer.
	*E. J. Helgren, B.S.Ch., B.S.B.....	City health officer.
	*Hal E. Hazel.....	Health officer.
	Edward James Johnston, M.D.....	Do.
	*John J. Sippy, M.D.....	District health officer.
	E. A. Peterson, M.D.....	Health officer.
	J. A. De Serpa, D.V.M.....	Do.
	*F. G. Crandall, M.D.....	District health officer.
Colorado:		
Boulder.....	*H. L. Morency, Ph.B., D.V.M.....	Director of public health and sanitation.
Colorado Springs.....	Omer R. Gillett, M.D.....	Health officer.
Denver.....	*F. W. Bailey.....	Manager of health and charity.
Fort Collins.....	T. C. Taylor, M.D.....	Health officer.
Grand Junction.....	E. H. Munro, M.D.....	City physician.
Greeley.....	W. A. Schoen, M.D.....	Do.
Fueblo.....	*W. E. Buck, M.D.....	Chief, department of health, sanitation and inspection.
Trinidad.....	O. F. Adams, M.D.....	City physician.
Connecticut:		
Ansonia.....	William H. O'Neil, M.D.....	Health officer.
Bridgeport.....	*Richard O'Brien Shea, M.D.....	Health officer and registrar of vital statistics.
Bristol.....	Benjamin B. Robbins, M.D.....	City health officer.
Danbury.....	James F. Young, M.D.....	Health officer.
Derby.....	Thomas F. Plunkett, M.D.....	Do.
East Hartford.....		
Enfield.....	Frank F. Simonton, M.D.....	Do.

¹ Under supervision of Dr. J. L. Pomeroy, health officer of Los Angeles County, Hall of Justice, Los Angeles, Calif.

City	Name of health officer	Official title
Connecticut—Continued.		
Fairfield.....	*Lawrence E. Poole, M.D., Dr. P.H.	Health officer and school physician.
Groton.....	Frank W. Hewes, M.D.	Health officer.
Hamden.....	George H. Joslin, M.D.	Do.
Hartford.....	*Charles P. Botsford, M.D.	Superintendent of health.
Manchester.....	D. C. Y. Moore, M.D.	Chairman, board of health.
Meriden.....	Joseph A. Cooke, M.D.	Health officer.
Middletown.....	John H. Mountain, M.D., D.D.S.	Do.
Milford.....		
Naugatuck.....		
New Britain.....	*Louis J. Dumont, M.D.	Superintendent of health.
New Haven.....	M.D.	Health officer.
New London.....	*Benjamin N. Pennell, D.V.S.	Do.
Norwalk.....	Robert E. Perdue, M.D.	Do.
Norwich.....	Harrison Gray, M.D.	City health officer.
Shelton.....	Francis I. Nettleton, Ph.B., M.D.	Health commissioner.
Stamford.....	*R. D. Fear, M.D., Dr.P.H.	Do.
Stonington.....	William D. Veal, M.D.	Health officer.
Stratford.....	De Ruyter Howland, M.D.	Town health officer.
Torrington.....		
Wallingford.....		
Waterbury.....	Edward J. Godfrey, M.D.	Health officer.
West Hartford.....	*Theodore Frank Foster, M.D., M.P.H.	Superintendent of health.
	N. Spector, M.D.	City health officer.
Willimantic.....		
Delaware:		
Wilmington.....	Fred F. Armstrong, M.D.	Secretary, board of health.
District of Columbia:		
Washington.....	*William C. Fowler, M.D.	Health officer.
	*Edward J. Schwartz, M.D.	Assistant health officer.
	*Arthur G. Cole.....	Chief clerk and deputy health officer.
	*James G. Cumming, M.D.	Director.
Bureau of preventable diseases.		
Medical inspection of schools.	*Joseph A. Murphy, M.D.	Do.
Food inspection.....	*Reid R. Ashworth, D.V.S.	Do.
Sanitary inspection.....	*J. Frank Butts, LL.B.	Do.
Vital statistics.....	*John H. Milligan.....	Do.
Chemical laboratory.....	*John B. Reed.....	Do.
Bacteriological laboratory.....	*John E. Noble.....	Do.
Serological laboratory.....	*Jesse P. Porch, D.V.M.	Do.
Microanalytical laboratory.	*Edwin R. Donaldson.....	Do.
Child welfare and hygiene service.	*Hugh J. Davis, M.D.	Do.
Pound.....	*Walter R. Smith.....	Poundmaster.
Florida:		
Daytona Beach.....	*Harry L. Richardson.....	Health officer.
Gainesville.....	W. Lassiter, M.D.	City health officer.
Jacksonville.....	*N. A. Upchurch, M.D.	Do.
Key West.....	H. C. Galey, M.D.	Do.
Lakeland.....		
Miami.....	*John W. Shisler, M.D.	Director of public welfare.
Orlando.....		
Pensacola.....	*W. A. McPhaul, M.D.	Director of health unit.
St. Augustine.....	H. E. White, M.D.	City and county health officer.
St. Petersburg.....	Claude B. Wright, M.D.	City physician.
Sanford.....	J. N. Tolar, M.D.	Do.
Tallahassee.....	*L. J. Graves, M.D.	Leon County health director.
Tampa.....	*J. R. McEachern, M.D.	City health officer.
West Palm Beach.....	*W. E. Van Landingham, M.D.	Do.
Georgia:		
Albany.....	*Hugo Robinson, PhG., M.D.	Commissioner of health.
Athens.....	*Wedford W. Brown, M.D.	Health commissioner, city and county.
Atlanta.....	*John P. Kennedy, M.D.	City health officer.
Augusta.....	*Henry Grady Callison, M.D.	Commissioner of health.
Brunswick.....	*H. L. Akridge, M.D., D.P.H.	Do.
Columbus.....		
Decatur.....		
Griffin.....	*William Clayton Humphries, M.D.	Do.
Lagrange.....	*S. C. Rutland, M.D.	Health officer.
Macon.....	*J. D. Applewhite, M.D.	Do.
Rome.....	*B. V. Elmore, M.D.	Commissioner of health.
Savannah.....	*Victor H. Bassett, M.D.	City health officer.
Thomasville.....	*H. B. Jenkins, M.D., M.S.P.H.	Health commissioner.
Valdosta.....	*Gordon T. Crozier, M.D., D.P.H.	Commissioner of health.
Waycross.....	*Geo. E. Atwood, M.D., D.P.H.	Do.
Idaho:		
Boise.....	*W. H. Rhodes.....	Health officer.
Pocatello.....	*Ross F. Garrett.....	Public health engineer.

City	Name of health officer	Official title
Illinois:		
Alton.....	Roy W. Merkle, M.D.....	Health commissioner.
Aurora.....	Geo. W. Haan, M.D.....	Do.
Belleville.....	*Frank T. Kern.....	Health officer.
Berwyn.....	*Edward J. Farrell, M.D.....	Health director.
Bloomington.....	B. Markowitz, M.D.....	Do.
Blue Island.....	*L. A. Burkhart.....	Commissioner of health.
Brookfield.....	Walter E. Baus, Ch.E.....	Health commissioner.
Calro.....	C. L. Weber, M.D.....	Health officer.
Calumet City.....	E. S. O'Brien, Ph.G., Dr. P.H.....	Health commissioner.
Canton.....	C. J. Johnston, M.D.....	President, board of health.
Centralia.....	H. E. Wilson, M.D.....	City health officer.
Champaign.....	C. George Appelle.....	Do.
Chicago.....	*Herman N. Bundesen, M.I.....	President, board of health.
	H. O. Jones, M.D.....	Director, medical service.
	Louis E. Schmidt, M.D.....	Secretary.
	F. O. Tonney, M.D.....	Director, technical service and research.
Bureau of communicable diseases.....	Isaac D. Rawlings, M.D.....	Chief of bureau.
Bureau of child welfare.....	Henry C. Niblack, M.D.....	Do.
Bureau of laboratories and research.....	John L. White, M.D.....	Do.
Bureau of public health engineering.....	Joel I. Connolly.....	Do.
Bureau of dairy products.....	Henry C. Becker, M.D.V.....	Do.
Bureau of food inspection.....	J. P. Kilcourse.....	Do.
Chicago Heights.....	A. H. Pannenberg, M.D.....	Health commissioner.
Cicero.....	*Frank J. Pokorney, M.D., Ph.G.....	Commissioner of health.
Danville.....		
Decatur.....	*William M. Talbert, M.D.....	City physician.
East Moline.....	J. Henry Fowler, M.D.....	Health officer.
East St. Louis.....	*Albert P. Lauman.....	Commissioner of health.
Elgin.....	*A. L. Mann, M.D. (address, Executive Officer, Health Department).	City physician and executive officer.
Elmhurst.....	A. L. Mathis, M.D.....	Health commissioner.
Elmwood Park.....	*Mrs. Laura Arney.....	President, board of health.
Evanston.....	*John W. H. Pollard, D.L., M.D.....	Commissioner of health.
Forest Park.....	Wm. C. Masslow, M.D.....	Do.
Freeport.....	K. B. Rieger, M.D.....	Do.
Galesburg.....	Edgar D. Wing, M.D.....	Do.
Granite City.....	*A. M. Jennings.....	Mayor and chairman of board of health.
Harrisburg.....	Charles Walden, M.D.....	City physician.
Harvey.....	M. R. Morse, M.D.....	Health officer.
Highland Park.....		
Jacksonville.....		
Joliet.....	*Lloyd B. Andrew, M.D.....	Health commissioner.
Kankakee.....	Joseph A. Guertin, M.D.....	City health officer.
Kewanee.....	H. N. Hefin, M.D.....	Commissioner of health.
La Grange.....	T. C. McDougal, M.D.....	Village health officer.
La Salle.....	*Arlington Ailes, M.D., C.P.H.....	Health commissioner.
Lincoln.....		
Mattoon.....	Lowell Arthur Neal, M.D.....	Commissioner of health.
Maywood.....	Robert L. Reynolds, M.D.....	Do.
Melrose Park.....	E. G. Brust, M.D.....	Health officer.
Moline.....	*A. C. Stouffer.....	Do.
Mount Vernon.....	William G. Parker, M.D.....	City physician.
Oak Park.....	Frank S. Needham, M.D.....	Commissioner of health.
Ottawa.....	E. P. Hatheway, M.D.....	City health officer.
Park Ridge.....	M. W. Caveney, M.D.....	Health commissioner.
Pekin.....	Nelson A. Wright, Jr., M.D.....	City health officer.
Peoria.....	E. A. Garrett, M.D.....	Health commissioner.
Quincy.....	*H. O. Collins, M.D.....	Public health officer.
Rock Island.....	*Otto Freister.....	Health officer.
Rockford.....	*Norman C. Bullock, M.D.....	Commissioner of health.
Springfield.....	C. W. Milligan, M.D.....	Superintendent of health.
Sterling.....	Walter I. Carolus, M.D.....	Health officer.
Streator.....	Theresa K. Jennings, M.D.....	President, board of health.
Urbana.....	W. L. Veirs, M.D.....	Chairman, board of health.
Waukegan.....	*Edward Cliff.....	City health officer.
West Frankfort.....	Wm. T. Fife.....	Do.
Wilmette.....	Martin H. Seifert, Ph.G., M.D.....	Commissioner of health.
Winnetka.....	*Howard A. Orvis, M.D., M.S. in P.H.....	Health officer.
Indiana:		
Anderson.....	E. M. Conrad, M.D.....	Secretary, city board of health.
Bedford.....	*Chas. Blackburn.....	Health commissioner.
Bloomington.....	R. A. De Motte, M.D.....	Secretary, city board of health.
Connersville.....	Herman W. Smelser, M.D.....	City health officer.
Crawfordsville.....	Fred N. Dauenherty, M.D.....	Secretary, board of health.
East Chicago.....	Joseph A. Teegarden, M.D.....	Do.
Elkhart.....	I. J. Markel, M.D.....	Do.
Elwood.....	Frank V. Newcomer, M.D.....	Do.
Evansville.....	L. E. Fritsch, M.D.....	Do.

City	Name of health officer	Official title
Indiana—Continued.		
Fort Wayne.....	Carl G. Miller, M.D.....	Health commissioner and secretary, board of health.
Frankfort.....	A. G. Chittick, M.D.....	Secretary, board of health.
Gary.....	Walter M. Behn, M.D.....	Do.
Goshen.....	Geo. A. Whippy, M.D.....	City health officer.
Hammond.....	Julius A. Chevigny, M.D.....	Commissioner of health.
Huntington.....	R. F. Frost, M.D.....	Secretary, board of health.
Indianapolis.....	*Herman G. Morgan, M.D.....	Do.
Jeffersonville.....	Samuel L. Adair, M.D.....	Do.
Kokomo.....	W. J. Marshall, M.D.....	Do.
La Fayette.....	M. M. Lairy, M.D.....	Do.
La Porte.....	Jon Nelson Kelly, M.D.....	Health officer.
Logansport.....	*Louis P. Deuner.....	Health inspector.
Marion.....	L. H. Eshleman, M.D.....	Secretary, board of health.
Michigan City.....	L. M. Robrock, M.D.....	Health officer.
Mishawaka.....	M. D. Wygant, M.D.....	Secretary, board of health.
Muncie.....	J. H. Williams, M.D.....	Do.
New Albany.....	Anna I. McKamy, Ph.D., M.D.....	Do.
Newcastle.....	Walter M. Stout, M.D.....	Do.
Peru.....	W. H. Wagoner, M.D.....	Do.
Richmond.....	M. F. Johnston, M.D.....	Commissioner of health.
Shelbyville.....	Walter C. McFadden, M.D.....	Secretary, city board of health.
South Bend.....	J. B. Berteling, M.D.....	Do.
Terre Haute.....	Amos H. Caffee, M.D.....	Do.
Vincennes.....	Robert S. Moore, M.D.....	Do.
Whiting.....	B. B. Reeve, M.D.....	Do.
Iowa:		
Ames.....	C. A. Aplin, M.D.....	Health officer.
Boone.....	William Woodburn, M.D.....	Do.
Burlington.....	*Finis Suggett, M.D.....	County health officer.
Cedar Rapids.....	Thomas F. Suchomel, M.D.....	City physician.
Clinton.....	Leslie K. Fenlon, Ph.G., M.D.....	City health officer.
Council Bluffs.....	Raymond M. Rice, M.D.....	Do.
Davenport.....	*A. B. Kuhl, Jr., M.D.....	Director of public health.
Des Moines.....	H. E. Ransom, M.D.....	Commissioner of health.
Dubuque.....	Walter J. Connell, M.D., M.P.H.....	Health director.
Fort Dodge.....	*Tom Riordan.....	Sanitary police.
Fort Madison.....	Harold F. Noble, M.D.....	City physician.
Iowa City.....	Isom A. Rankin, M.D.....	City health officer.
Keokuk.....	Charles A. Dimond, M.D.....	Physician to board of health.
Marshalltown.....	R. S. Grossman, M.D.....	Health officer.
Mason City.....	C. M. Franchere, M.D.....	City health director.
Muscatine.....	Rodney M. Arey, M.D.....	City health officer.
Newton.....	M. R. Hammer, M.D.....	City physician.
Oskaloosa.....	Oscar J. Du Bois, D.O.....	Health officer.
Ottumwa.....		
Sioux City.....	*W. S. Petty, M.D.....	Health commissioner.
Waterloo.....	J. E. Ridenour, M.D.....	Health officer.
Kansas:		
Arkansas City.....	P. F. Theis, M.D.....	City health officer.
Atchison.....	William K. Fast, M.D.....	County health officer.
Chanute.....	James A. Butin, M.D.....	City health officer.
Coffeyville.....	P. S. Townsend, M.D.....	Do.
Dodge City.....	O. L. Hooper, M.D.....	City physician.
Eldorado.....	L. C. Murray, M.D.....	County health officer.
Emporia.....	*C. H. Munger, M.D.....	Do.
Fort Scott.....	C. L. Mosley, M.D.....	City health officer.
Hutchinson.....	Guy R. Walker, M.D.....	City physician.
Independence.....	Stephen Flatt, M.D.....	Do.
Kansas City.....	*S. David Henry, M.D.....	Director of health.
Lawrence.....	E. R. Keith, M.D.....	City health officer.
Leavenworth.....	A. L. Suwalsky, M.D.....	City physician and health officer.
Manhattan.....	J. R. Mathews, M.D.....	County and city health officer.
Newton.....	M. C. Martin, M.D.....	County health officer.
Parsons.....	M. C. Ruble, M.D.....	City physician and health officer.
Pittsburg.....	C. Mart Montes, M.D.....	City health officer.
Salina.....	S. T. Blades, M.D.....	Do.
Topeka.....	*F. P. Helm, M.D.....	Do.
Wichita.....	*Russell E. Hobbs, M.D.....	Director of public welfare.
Kentucky:		
Ashland.....	*R. D. Higgins, M.D.....	Director, Boyd County Health Department.
Bowling Green.....	*George M. Wells, M.D.....	Director, Warren County Health Department.
Covington.....	James P. Riffe, M.D.....	Health officer.
Fort Thomas.....	Frank H. Southgate, M.D.....	Do.
Frankfort.....		
Henderson.....	*Robert K. Galloway, M.D., M.P.H.....	County health officer.
Hopkinsville.....	Philip E. Haynes, M.D.....	City health officer.
Lexington.....	*Dennis A. Furlong.....	Acting health officer.
Louisville.....	C. H. Harris, M.D.....	Director of health.
Middlesboro.....		
Newport.....	John Todd, M.D.....	City health officer.

City	Name of health officer	Official title
Kentucky—Continued.		
Owensboro.....	*L. Hubert Meedley, M.D.....	Daviess County health officer.
Paduah.....	Palmer H. Reed, M.D.....	City health officer.
Louisiana:		
Alexandria.....	R. B. Wallace, M.D., and W. L. Murrell, M.D.....	President, board of health.
Baton Rouge.....	T. Jeff McHugh, M.D.....	City health officer.
Bogalusa.....	Joseph H. Slaughter, M.D.....	City physician.
Lafayette.....	M. R. Cushman, M.D.....	Health officer.
Lake Charles.....	W. F. Bordelon, M.D.....	President, board of health.
Monroe.....	D. I. Hirsch, M.D.....	Do.
New Orleans.....	*William Henry Robin, M.D.....	Superintendent of public health.
Shreveport.....	*John H. Cannon, M.D.....	Do.
Maine:		
Auburn.....	E. Leathers, M.D.....	Health officer.
Augusta.....	George A. Coombs, M.D.....	Do.
Bangor.....	*Harry D. McNeil, M.D.....	Local health officer.
Bath.....	Joseph I. Smith, M.D.....	Health officer and milk inspector.
Biddeford.....	*John W. Mahoney.....	Local health officer.
Lewiston.....	*Robert J. Wiseman, Jr., M.D.....	Health officer.
Portland.....	*Thomas Tetreau, M.D.....	City health officer.
Sanford.....	*William Henry Kelly, M.D.....	Local health officer.
South Portland.....		
Waterville.....	*Arthur R. Daviau, M.D.....	Health officer.
Westbrook.....	Patrick H. Welch.....	Local health officer.
Maryland:		
Annapolis.....	James J. Murphy, M.D.....	City health officer.
Baltimore:		
Administration.....	*Huntington Williams, M.D., Dr. P.H.....	Commissioner of health.
	*J. Frederick Hempel, M.D.....	Assistant commissioner of health.
	*Harry S. Mustard, M.D.....	Health officer, eastern health district.
Medical section:		
Bureau of communicable diseases.....	*Adolph Weinzirl, M.D.....	Epidemiologist.
Bureau of venereal diseases.....	*Ferdinand O. Reinhard, M.D.....	Director.
Bureau of tuberculosis.....	Bartus T. Baggott, M.D.....	Do.
Bureau of child welfare.....	*William H. F. Warthen, M.D.....	Do.
Division of school hygiene.....	H. Warren Buckler, M.D.....	Chief.
Dental clinics.....	Morris Cramer, D.D.S.....	Supervisor.
Bureau of laboratories.....	*C. Leroy Ewing.....	Director.
Bureau of public health nursing.....	*Jane B. Laib, R.N.....	Do.
Sydenham Hospital.....	*Myron G. Tull, M.D.....	Superintendent.
Sanitary section.....	*R. S. Craig.....	Director.
Bureau of food control.....	*Ferdinand A. Korff.....	Do.
Bureau of milk control.....	*John A. Lescure.....	Do.
Bureau of environmental hygiene.....	*Wilmer H. Schulze, Phar. D.....	Do.
Bureau of meat inspection.....	*William Brenner, V.D.....	Chief.
Cumberland.....	*Harvey H. Weiss.....	Health officer and registrar of vital statistics.
Frederick.....	*E. C. Kefauver, M.D.....	City and county health officer.
Hagerstown.....	*W. R. Cameron, M.D.....	Do.
Salisbury.....	*S. H. Hurdle, M.D.....	Deputy State health officer.
Massachusetts:		
Adams.....	James F. McLaughlin, M.D.....	Chairman, board of health.
Amesbury.....	Clarence S. Morse.....	Agent, board of health.
Arlington.....	*William H. Bradley.....	Agent and clerk, board of health.
Athol.....	Marion B. Sitley, M.D.....	Secretary, board of health.
Attleboro.....	William O. Hewitt, M.D.....	Health officer.
Belmont.....	*Thomas F. Harris.....	Agent, board of health.
Beverly.....	*Alonzo O. Woodbury.....	Clerk and agent, board of health.
Boston.....	*Francis X. Mahoney, D.V.M., M.D.....	Health commissioner.
	*Joseph A. Cahalan.....	Secretary.
Divisions—		
Medical.....	*M. Victor Safford, M.D.....	Deputy commissioner.
Communicable diseases.....	*Frederick J. Bailey, M.D.....	Do.
Bacteriological laboratory.....	*Karl R. Bailey, M.D.....	Do.
Food.....	*P. H. Mallowney, D.V.M.....	Do.
Child hygiene.....	Charles F. Willinsky, M.D.....	Do.
Sanitary.....	*M. Victor Safford, M.D.....	Acting deputy commissioner.
Tuberculosis.....	*George O'Donnell, M.D.....	Deputy commissioner.
Vital statistics.....	*Joseph W. Monahan.....	Do.
Braintree.....	Frank E. Stronach.....	Agent, board of health.
Brockton.....	David B. Tuholski, M.D.....	Health officer.
Brookline.....	Francis Parkman Denny, M.D.....	Do.
Cambridge.....	*S. B. Kelleher, M.D.....	Medical inspector.
Chelsea.....	*John F. Welch.....	Health officer.
Chicopee.....	*Gertrude M. DeWitt.....	Agent, board of health.
Clinton.....	*Frederick E. Murphy.....	Health officer.

City	Name of health officer	Official title
Massachusetts—Continued.		
Danvers.....	*Hogo Nappe, R.N.....	Health officer and milk inspector.
Dedham.....	Thomas J. Breman.....	Health inspector.
Easthampton.....	C. C. Buckner.....	Agent, board of health.
Everett.....	*William F. Hogan.....	Do.
Fairhaven.....	*W. F. Delano.....	Executive officer.
Fall River.....	*Earnest M. Morris, M.D.....	Health commissioner.
Fitchburg.....	*Fred R. Brigham.....	Agent, board of health.
Framingham.....	*David Moxon, B.Sc. in Bacteriology, C. P. H. *William P. O'Donnell.....	Do.
Gardner.....		Do.
Gloucester.....	George S. Rust, M.D.....	Physician to board of health.
Greenfield.....	*George P. Moore.....	Agent, board of health.
Haverhill.....	*George T. Lennon.....	Clerk and agent, board of health.
Holyoke.....	*Daniel P. Hartnett, Ph.G.....	Health officer.
Lawrence.....	*Daniel J. Costello.....	Clerk, board of health.
Leominster.....	Hugh E. Crain.....	Agent, board of health.
Lowell.....	*John J. McNamara, M.D.....	Director of health.
Lynn.....	Walter L. Burns, M.D.....	Commissioner of health.
Malden.....	*May C. Welsh.....	Secretary and agent, board of health.
Marlborough.....	*John J. Cassidy.....	Agent, board of health.
Medford.....	William N. Lanigan, M.D.....	Medical inspector.
Melrose.....	Clarence P. Holden, M.D.....	Chairman, board of health.
Methuen.....	John Oddy, M.D.....	Board of health physician.
Milford.....		
Milton.....		
Natick.....	Thomas F. Morris.....	Agent, board of health.
Needham.....	*G. Donald Buckner, S.B. in P.H.....	Health officer.
New Bedford.....	*Wm. G. Kirschbaum.....	Agent and executive officer.
Newburyport.....	*Wilbur N. O'Brien, Ph.G.....	Agent, board of health.
Newton.....	*Francis Geo. Curtis, M.D.....	Chairman, board of health.
North Adams.....	*Douglas W. Hyde, S.E.....	Agent, board of health.
North Attleboro.....	Daniel J. Kiley, M.D.....	Health officer.
Northampton.....	*George R. Turner.....	Agent, board of health.
Norwood.....	John A. Shannon.....	Do.
Peabody.....	*Percy F. Murray.....	Do.
Pittsfield.....	*Willys Merritt Monros, M.D.....	Health officer.
Plymouth.....	Walter D. Shurtleff, M.D.....	Do.
Quincy.....	Edmund B. Fitz Gerald, M.D.....	Commissioner of health.
Revere.....	Francis Licata, M.D.....	Chairman, board of health.
Salem.....	*John J. McGrath.....	Agent, board of health.
Saugus.....	Henry C. Westendarp.....	Chairman, board of health.
Somerville.....	*Frank L. Morse, M.D.....	Medical inspector and bacteriologist.
Southbridge.....	Albert R. Brown.....	Agent, board of health.
Springfield.....	*Jacob R. Sackett.....	Agent and health officer.
Stoneham.....	*George A. Hinchcliffe.....	Secretary, health officer.
Swampscott.....	*Clarence W. Horton.....	Health officer.
Taunton.....	Andrew J. Leddy, M.D.....	Chairman, board of health.
Wakefield.....	David Taggart.....	Health officer and agent.
Waltham.....	*Joseph T. Muleahy.....	Director of public welfare.
Watertown.....	*Fred W. Bodge.....	Agent, board of health.
Webster.....	Wilfred P. Bazinst, D.D.S.....	Health officer.
Wellesley.....	Curtis M. Hilliard.....	Supervisor of health.
West Springfield.....	J. J. Lysaght.....	Agent, board of health.
Westfield.....	Robert M. Marr, M.D.....	Chairman, board of health.
Weymouth.....	F. L. Doucett, M.D.....	Clerk, board of health.
Winchester.....	*Maurice Dineen.....	Agent, board of health.
Winthrop.....	*William D. Childress.....	Health officer.
Woburn.....	*Edward F. Gorman.....	Agent and secretary, board of health.
Worcester.....	*Peter Owen Shea, M.D.....	Director of public health and school hygiene.
Michigan:		
Adrian.....	W. S. Mackenzie, M.D.....	Health officer and city physician.
Alpena.....	F. J. O'Donnell, M.D.....	Health officer.
Ann Arbor.....	John A. Wessinger, M.D., Dr. P. H.....	Do.
Battle Creek.....	*A. A. Hoyt, M.D.....	Health officer and registrar.
Bay City.....	G. W. Moore, M.D.....	Health officer.
Benton Harbor.....	Edwin Roy Taylor, M.D.....	Director of public health.
Dearborn.....	C. A. Christensen, M.D.....	Commissioner of health and sanitation.
Detroit.....		
	Board of health:	
	Gustavus D. Pope.....	President.
	William M. Walker.....	Vice president.
	William A. Evans, M.D.....	
	L. O. Geib, M.D.....	
	Executive staff, department of health:	
	*Henry F. Vaughan, Dr. P.H.....	Commissioner of health.
	Bert U. Estabrook, M.D.....	Deputy Commissioner.
	*Fred M. Meader, M.D.....	Deputy commissioner and medical director.
	*John F. Norton, Ph.D.....	Director of laboratories.
	*Don W. Gudakunst, M.D.....	Director, school health service.
	A. C. Thompson, D.D.S.....	Director of school dental service.
	*Miss Grace Ross, B.N.....	Superintendent of nursing.

City	Name of health officer	Official title
Michigan—Continued.		
Detroit.....	Executive staff, department of health—Continued. Ward F. Seeley, M.D.....	Director of Herman Kiefer Hospital, maternity division.
	Russell W. Alles, M.D.....	Director of prenatal division.
	*Major John F. Roehl.....	Director of special investigation.
	*R. S. Dixon, M.D.....	Director of division of venereal diseases.
	*Henry D. Chadwick, M.D.....	Tuberculosis controller.
	*B. H. Douglas, M.D.....	Superintendent of William H. Maybury Sanatorium.
	*George E. Phillips.....	Superintendent of Herman Kiefer Hospital.
	*F. Gardner Legg, C.E.....	Director of sanitary engineering.
	*Edward C. Schultz.....	Director of dairy and food inspection.
	*Arthur P. Derby, M.D.....	Director of division of tuberculosis.
	Don J. Barnes, M.D.....	Director of division of child welfare.
	*G. Arthur Blakeslee.....	Director of division of vital statistics.
	*H. Wellington, Yates, M.D.....	Director of division of cancer control.
	*John E. Gordon, M.D.....	Medical epidemiologist of Herman Kiefer Hospital.
Ecorse.....	Lawrence H. Van Becelaere, M. D.	Health officer.
Escanaba.....		
Ferndale.....	Willard G. Beattie, M.D.....	Do.
Flint.....	*Kenneth B. Moore, M.D.....	Do.
Grand Rapids.....	*Allison H. Edwards, M.D.....	Do.
Grosse Pointe.....	*Benjamin H. Warren, M.D.....	Health commissioner.
Hamtramck.....	Charles R. Sheridan, M.D.....	Do.
Highland Park.....	George M. Livingston, M.D.....	Health officer and city physician.
Holland.....	Wm. Westrate, M.D.....	Health officer.
Iron Mountain.....	J. L. Browning, M.D.....	Do.
Ironwood.....	C. C. Urquhart, M.D.....	City health officer.
Jackson.....	*Floyd Raymond Town, M.D.....	Health officer.
Kalamazoo.....	*John L. Lavan, M.D.....	Director of public health.
Lansing.....	*E. R. Van der Slice, M.D.....	Health officer.
Lincoln Park.....	H. K. Butterworth, M.D.....	Do.
Marquette.....	*T. R. Laughbaum, M.D.....	City health officer.
Menominee.....	John T. Kaye, M.D.....	Health officer.
Monroe.....	Wm. F. Acker, M.D.....	Do.
Mount Clemens.....	W. S. Kane, M.D.....	Do.
Muskegon.....	M. E. Stone, M.D.....	Do.
Muskegon Heights.....	O. M. La Core, M.D.....	Do.
Niles.....	Roy S. Waterson, M.D.....	Do.
Owosso.....	Walter E. Ward, M.D.....	Do.
Pontiac.....	*Hubert M. Heitsch, M.D.....	Director of public health.
Port Huron.....	A. L. Callery, M.D.....	Health officer.
River Rouge.....	Harvey S. Broderson, M.D.....	City health officer.
Royal Oak.....		
Saginaw.....	*Frank A. Poole, M.D.....	Health officer.
Sault Ste. Marie.....	E. A. Cornell, M.D.....	Do.
Traverse City.....	George A. Holliday, M.D.....	Do.
Wyandotte.....	Earl H. Engel, M.D.....	Do.
Ypsilanti.....	D. N. Robb, M.D.....	Do.
Minnesota:		
Albert Lea.....	D. S. Branham, M.D.....	Do.
Austin.....	Jay K. McKenna, M.D.....	Do.
Brainerd.....	V. E. Quantstrom, M.D.....	City health officer.
Duluth.....	*M. McC. Fischer, M.D.....	Director of public health.
Faribault.....	Frederick U. Davis, M.D.....	Health commissioner.
Hibbing.....	*H. A. Weinick, M.D.....	Chairman, board of health.
Mankato.....	W. A. Beach, M.D.....	Health officer.
Minneapolis.....	*Francis E. Harrington, LL.D., M.D.....	Commissioner of health.
Rochester.....	C. H. Mayo, M.D. ¹	Health officer.
St. Cloud.....	H. W. Goehrs, M.D.....	City physician.
St. Paul.....	*Benjamin F. Simon, M.D.....	Chief health officer.
South St. Paul.....	O. S. Ely, M.D.....	Commissioner of health.
Virginia.....	J. Arnold Malmstrom, M.D.....	Health officer.
Winona.....	William V. Lindsay, M.D.....	Do.
Mississippi:		
Biloxi.....		
Clarksdale.....	*Vernon Baker Harrison, M.D.....	Director, county health department.
Columbus.....	C. E. Lehmborg, M.D.....	County health officer.
Greenville.....	*John W. Shackelford, M.D., M.P.H.....	Director, county health department.
Greenwood.....	*Levi A. Barnett, M.D.....	Director of health.
Gulfpport.....		
Hattiesburg.....	*B. D. Blackwelder, M.D., C.P.H.....	Health officer.
Jackson.....	*W. E. Noblin, M.D.....	Director, county health department.
Laurel.....	L. R. Beech, M.D.....	Health officer.
McComb.....		
Meridian.....	*D. V. Galloway, M.D., M.P.H.....	Director, county health department.
Natchez.....	*Loren Wallin, M.D.....	Do.
Vicksburg.....	*F. Michael Smith, M.D.....	Do.

¹ D. C. Lockhead, M.D., D.P.H., deputy health officer, full time.

City	Name of health officer	Official title
Missouri:		
Cape Girardeau	*H. Haman, Jr.	Health officer.
Columbia	*W. A. Norris, M.D.	Health commissioner.
Hannibal	*E. M. Lucke, M.D.	Health officer.
Independence	F. L. Cook, M.D.	City physician.
Jefferson City	James G. Bruce, M.D.	Do.
Joplin	A. Benson Clark, M.D.	Commissioner of health and sanitation.
Kansas City	Jabez N. Jackson, L.L.D., M.D.	Health director.
Maplewood	Pierre M. Brossard, M.D.	Health commissioner.
Moberly	C. C. Smith, M.D.	City health officer.
St. Charles	Will L. Freeman, M.D.	Do.
St. Joseph	A. J. Smith, M.D.	Health officer.
St. Louis	*Jos. F. Bredeck, M.D., D.P.H.	Health commissioner.
	*Paul J. Zentay, M.D.	Assistant health commissioner.
	*W. Scott Johnson	Sanitary engineer.
	*H. I. Spector	Tuberculosis controller.
	*Joseph C. Willett, D.V.M.	Chief of laboratories.
	*John S. Koen, D.V.S.	Chief of food control.
	*Ernest C. McCulloch, D.V.M.	Milk controller.
	*Walter E. Cook	Field supervisor.
	*Harry M. Stamm, D.D.S.	Dental supervisor.
	*A. L. Kavanagh, M.D.	Chief of venereal clinic.
	*Mildred Sanderson, R.N.	Municipal nurses' supervisor.
	*J. Atkinson Smith, M.D.	Chief, communicable disease section.
	*Leon Grosch	Librarian, vital statistics section.
		Epidemiologist.
	*Milton R. Fisher, D.V.M.	Chief veterinary milk inspector.
	*W. C. Dillard, D.V.M.	Veterinary meat inspector.
	*H. V. Persells, D.V.M.	Assistant veterinary milk inspector.
	*Henry A. Faust, D.V.M.	Veterinarian.
	*C. B. Michel, D.V.M.	Veterinary meat inspector.
	*Downey L. Harris, M.D.	Rabies controller.
	*J. H. Brooks	Sanitary officer.
Sedalia	*Ralph W. Langston	Commissioner of health and sanitation.
Springfield		Health commissioner.
University City	O. P. Hampton, Jr., M.D.	Do.
Webster Groves	Carl C. Irick, M.D.	
Montana:		
Anaconda	John J. Males, M.D.	City physician.
Billings	E. G. Balsam, M.D.	Secretary, board of health.
Butte	J. J. Kane, M.D.	City physician.
Great Falls	*F. L. Watkins, M.D.	City and county health officer.
Helena	*William Copenhaver, Jr., M.D.	City health officer.
Missoula	*Frank D. Pease, M.D.	City and county health officer.
Nebraska:		
Beatrice	Roy Noble, M.D.	City physician.
Fremont	J. S. Devries, M.D.	Do.
Grand Island	W. M. Wheeler	City engineer.
Hastings	E. J. Latta, M.D.	City physician.
Lincoln	M. F. Arnholt, M.D.	Superintendent of health.
Norfolk	V. L. Seman, M.D.	Secretary, board of health.
North Platte	J. B. Redfield, M.D.	City physician.
Omaha	*Millard Langfeld, M.D.	Director of public health.
Nevada:		
Reno	A. F. Adams, M.D.	Secretary, board of health.
New Hampshire:		
Berlin	*Eli A. Marcoux, B.S. in Ch.E.	Health officer and milk inspector.
Claremont	William P. Prescott	Health officer.
Concord	*Travis Follard Burroughs, M.D., C.P.H.	Sanitary officer.
Dover	*William E. Whiteley	Executive officer.
Keene	*Fred C. Nims	Health officer.
Laconia	E. J. Gage, M.D.	Do.
Manchester	*Howard A. Streeter, M.D.	Do.
Nashua	Deering G. Smith, M.D.	Chairman, health department.
Portsmouth	Frederick S. Gray, M.D.	City physician, inspector, and bacteriologist.
Rochester	Charles E. Goodwin	Health officer.
New Jersey:		
Asbury Park	*Budd H. Obert	Health officer and registrar of vital statistics.
Atlantic City	Samuel L. Salasin, M.D.	Health officer.
Bayonne	William W. Brooke, M.D.	Do.
Belleville	*Eugene T. Berry	Do.
Bloomfield	*Joseph C. Saile, D.O.	Health officer-secretary.
Bridgeton	*John G. Robbins	Sanitary inspector.
Burlington	*Mrs. Kathryn C. Phillips	Health officer.
Camden	*A. L. Stone, M.D.	Director of public health.
Carteret		
Cliffside Park	Fred J. Dyer	Health inspector.
Clifton	Jeremiah P. Quinlan	Health officer.
Collingswood	Harold K. Eynon, M.D.	Do.
Dover	*John G. Taylor	Do.
East Orange	*Frank J. Osborne	Health officer and registrar.

City	Name of health officer	Official title
New Jersey—Continued.		
Elizabeth.....	*Louis J. Richards, B.S. in S.E....	Health officer.
Englewood.....	*H. R. H. Nicholas.....	Do.
Garfield.....	Charles B. Bleasby, M.D.....	Do.
Gloucester City.....	J. Alonzo Beek, M.D.....	Do.
Hackensack.....	*L. Van D. Chandler.....	Do.
Harrison.....	*John T. McClure.....	Do.
Hawthorne.....	William Missouellie, M.D.....	Do.
Hoboken.....	J. F. K. Stack, M.D.....	Commissioner of health.
Irvington.....	*William S. Bailey.....	Acting health officer.
Jersey City.....	*James J. Hagan.....	Health officer.
Kearny.....	*Amos Field, Jr.....	Do.
Linden.....	*Maidie E. Noe.....	Do.
Lodi.....	H. H. Brevoort, M.D.....	Health inspector.
Long Branch.....	*R. C. Erickson.....	Health officer.
Millville.....	Richard H. Knowles, Ph.G.....	Do.
Montclair.....	*Carl T. Pomeroy, C.P.H.....	Do.
Morristown.....	*John F. Kilkenny.....	Do.
New Brunswick.....	E. Irving Cronk, M.D.....	Health officer and registrar of vital statistics.
Newark.....	*Charles V. Craster, M.D., D.P.H.....	Health officer.
Nutley.....	*Eugene H. Sullivan.....	Health officer and registrar.
Orange.....	*Lenore Young Wylie, R.N.....	Health officer and registrar of vital statistics.
Passaic.....	John N. Ryan, M.D.....	Health officer.
Paterson.....	*Frederick P. Lee, M.D.....	Do.
Perth Amboy.....	*Chas. S. Thompson, D.V.S.....	Do.
Phillipsburg.....		
Plainfield.....	*Andrew J. Krog.....	Acting health officer.
Pleasantville.....	Robert M. Grier, M.D.....	Health inspector.
Rahway.....	*Fred M. Williams.....	Health officer and registrar.
Red Bank.....	W. H. Lawes, V.S.....	Sanitary inspector.
Ridgefield Park.....	*William F. Reynolds, D.V.M.....	Health officer.
Ridgewood.....	Harry H. Pettit, M.D.....	Do.
Roselle.....	Perry Alexander Proudfoot, M.D.....	Do.
Rutherford.....	*Marine Dunn.....	Do.
South Orange.....	A. C. Benedict, M.D.....	Do.
South River.....	Abraham A. Pansy, M.D.....	Sanitary inspector.
Summit.....	Henry P. Dengler, M.D.....	Health and executive officer.
Trenton.....	*Alton S. Fell, M.D.....	Health officer.
Union City.....	Grant P. Curtis, M.D.....	Do.
West New York.....	*Rudolph Kunze.....	Chief inspector.
West Orange.....	*David E. Buckley.....	Health officer and registrar.
Westfield.....	*Andrew Carney.....	Executive officer.
New Mexico:		
Albuquerque.....	*James R. Scott, Ph.D., M.D.....	County health officer.
Roswell.....	Wm. W. Phillips, M.D.....	Do.
Santa Fe.....	*E. F. McIntyre, M.D.....	City and county health officer.
New York:		
Albany.....	*Daniel V. O'Leary, M.D.....	Commissioner of health.
Amsterdam.....	P. J. Fitzgibbons, M.D.....	Health officer.
Auburn.....	John W. Copeland, M.D.....	Do.
Batavia.....	Emery F. Will, M.D.....	Do.
Beacon.....		
Binghamton.....	Chalmer J. Longstreet, M.D.....	Do.
Buffalo.....	*Francis E. Fronczak, LL.D., M.D., Dr. Sc. P.H.....	Health commissioner.
	*Edward Durney, M.D.....	Deputy health officer.
	*Charles A. Bentz, M.D.....	Do.
	*Edward Durney, M.D.....	Director.
	*Charles A. Bentz, M.D.....	Do.
Division of child hygiene, Communicable disease and division of labora- tories.		
Division of vital statistics.	*G. H. Westinghouse, M.D.....	Registrar.
Division of sanitation.	*Frank E. Trumble.....	Assistant chief inspector.
Division of smoke abate- ment.	*Frank E. Trumble.....	Do.
Division of food inspection.		
Cohoes.....	*Willard B. Diebold.....	Do.
Corning.....	Matthew J. Keough, M.D.....	Commissioner of health.
Cortland.....	Henry E. Elwood, Jr., M.D.....	Health officer.
Dunkirk.....	*Daniel R. Reilly, M.D., C.P.H.....	County commissioner of health.
Elmira.....	G. E. Ellis, M.D.....	Health officer.
Endicott.....	Reeve B. Howland, M.D.....	Do.
Floral Park.....	M. W. Welch, M.D.....	Do.
Freeport.....	Arthur E. Goldfarb, M.D.....	Do.
Fulton.....	W. H. Runcie, M.D.....	Do.
Geneva.....	F. Edward Fox, M.D.....	Do.
Glen Cove.....	C. W. Grove, M.D.....	Do.
Glens Falls.....	Joseph B. Conolly, M.D.....	Do.
Gloversville.....	*Virgil D. Selleck, P.H.D., M.D.....	Do.
Hempstead.....	Felix L. Johnson, M.D.....	Do.
Herkimer.....	Smith A. Combes, M.D.....	Do.
Hornell.....	James W. Graves, M.D.....	Do.
Hudson.....	George E. Taylor, M.D.....	Do.
	*Louis Van Hoesen, M.D.....	County commissioner of health.

City	Name of health officer	Official title
New York—Continued.		
Ithaca	*Lewell T. Genung, M.D.	Health officer and school physician.
Jamestown	William M. Sill, M.D.	Superintendent of public health.
Johnson City	Rollin O. Croster, M.D.	Health officer.
Johnstown	Guy Vail Wilson, M.D.	Commissioner of public health and welfare.
Kenmore	E. R. Linklater, M.D.	Health officer.
Kingston	Lester E. Sanford, M.D.	Do.
Lackawanna	A. S. Culkowski, M.D.	Do.
Little Falls	Geo. S. Eveleth, M.D.	Do.
Lockport	Joseph C. Healy, M.D.	City health officer.
Lynbrook		
Mamaroneck	*E. M. Clark, M.D.	Health officer.
Massena	C. E. Elkins, M.D.	Do.
Middletown	H. J. Shelly, M.D.	Do.
Mount Vernon	Frank W. Shipman, M.D.	Commissioner of health.
New Rochelle	*Bertrand Francis Drake, M.D.	Health officer.
New York	John L. Rice, M.D.	Commissioner of health.
	Herman T. Peck, M.D.	Deputy commissioner of health.
Bureau:		
General Administration	*Bernard F. Plunkett	Secretary.
Records	John T. Walsh, M.D.	Acting director.
Sanitation	William H. Pound, M.D.	Sanitary superintendent.
Preventable diseases	Wm. H. Best, M.D.	Acting director.
Child hygiene	Isadore Cohen, M.D.	Do.
Nursing	Miss Amelia H. Grant	Director.
Public health education	Charles F. Bolduan, M.D.	Do.
Laboratories	William H. Park, M.D.	Do.
Food and drugs	*Thomas F. Everett	Acting director.
Newburgh	Thomas J. Burke, M.D.	Health officer.
Niagara Falls	E. E. Gillick, M.D.	Do.
North Tonawanda	Henry C. Lapp, M.D.	Do.
Ogdensburg	Frederick E. Clark, M.D.	Do.
Olean	Joseph P. Garen, M.D.	Do.
Oneida	D. H. Conterman, M.D.	Do.
Oneonta		
Ossining	Robert R. Bloom, Ch. B., M.D.	Do.
Oswego	James E. Mansfield, M.D.	Do.
Peekskill	J. Douglas Barry, M.D.	Do.
Plattsburg	Leo F. Schiff, M.D.	Do.
Port Chester	Wm. J. Sheehan, M.D.	Do.
Port Jervis	G. Otto Pobe, M.D.	Do.
Poughkeepsie	*William H. Couger, M.D.	Do.
Rensselaer	James C. Sharkey, M.D.	Do.
Rochester	*Arthur M. Johnson, M.D.	Do.
Rockville Center	Arthur D. Jaques, M.D.	Health commissioner.
Rome	Lewis N. Eames, M.D.	Health officer.
Saratoga Springs	Frederic J. Resseguie, M.D.	Do.
Schenectady	Fred J. MacDonald	Commissioner of health.
Syracuse	*George C. Ruhland, M.D.	Do.
Tonawanda	R. H. Wilcox, M.D.	Health officer.
Troy	James H. Flynn, M.D.	Commissioner of health.
Utica	*Hugh H. Shaw, M.D.	Health officer.
Valley Stream	John M. Quinn, M.D.	Do.
Watertown	George B. Van Doren, M.D.	Do.
Watervliet	C. A. Birmingham, M.D.	Commissioner of health.
White Plains	*Edward H. Marsh, M.D.	Deputy commissioner, county department of health.
Yonkers	*Clarence W. Buckmaster, M.D., C. P. H.	Commissioner of health.
North Carolina:		
Asheville	*Daniel E. Sevier, M.D.	Health officer.
Charlotte	*G. L. Rea, M.D.	Do.
Concord	*Daniel Greenlee Caldwell, M.D.	County health officer.
Durham	*J. H. Epperson	Superintendent of health.
Elizabeth City	I. A. Ward, M.D.	City health officer.
Fayetteville	L. L. Williams, M.D., C. P. H.	City and county health officer.
Gastonia	Mc. G. Anders, M.D.	City physician and health officer.
Goldsboro	*F. M. Register, M.D.	Director of public health.
Greensboro	*C. C. Hudson, M.D.	City health officer.
High Point	W. J. McAnally, M.D.	Do.
Kinston	*Z. V. Moseley, M.D.	County health officer.
New Bern	N. M. Gibbs, M.D.	County and city physician.
Raleigh	*A. C. Bulla, M.D.	City and county health officer.
Rocky Mount	*Roy Norton, M.D.	City health superintendent.
Salisbury	*Chas. Wallace Armstrong, M.D.	City and county health officer.
Shelby	D. F. Moore, M.D.	City health officer.
Statesville	James M. Alexander, M.D.	Health physician.
Thomasville		
Wilmington	*A. H. Elliot, M.D.	County health officer.
Wilson	*W. H. Anderson, M.D.	City and county health officer.
Winston-Salem	*R. L. Carlton, M.D.	City health officer.
North Dakota:		
Bismarck	Albert M. Fisher, M.D.	Do.
Fargo	*B. K. Kilbourne, M.D.	Do.

City	Name of health officer	Official title
North Dakota—Continued.		
Grand Forks	E. C. Haagensen, M.D.	City health officer.
Minot	J. L. Devine, M.D.	Do.
Ohio:		
Akron	*Melville D. Ailes, LL.B., M.D.	Director of health.
Alliance	*Floyd R. Stamp, D.O., M.D.	Health commissioner and city physician.
Ashland	C. B. Meuser, M.D.	Director of welfare.
Ashtabula	James H. Park, M.D.	Health officer.
Barberton	H. A. Finefrock, M.D.	Health commissioner.
Bellaire	William J. Shepard, M.D.	Do.
Bucyrus	W. G. Carlisle, M.D.	Do.
Cambridge	C. L. Vorhies, M.D.	Do.
Campbell	Jas. S. Mariner, M.D.	Do.
Canton	Frank Merrick Sayre, M.D.	Do.
Chillicothe	*R. E. Bower, Ph.B., M.D.	Do.
Cincinnati	*Wm. H. Peters, M.D.	Commissioner of health.
Cleveland	*Harold J. Knapp, M.D.	Do.
Division—		
Communicable diseases	T. G. Duncan, M.D.	Director.
Child hygiene	R. J. Ochsner, M.D.	Do.
Laboratories	E. B. Buchanan	Do.
Food and drug administration.	R. F. Leslie, D.V.M.	Do.
Public health nurses	Cora M. Templeton, R.N.	Do.
Cleveland Heights	*Robert Lockhart, M.D.	Director of health.
Columbus	*N. C. Dysart, Ph.C., M.D.	Health commissioner.
Coshocton	*D. M. Criswell, M.D.	Do.
Cuyahoga Falls	*R. H. Markwith, M.D.	Commissioner of health.
Dayton	*A. O. Peters, M.D.	Do.
East Cleveland	George W. Stober, M.D.	Director of health.
East Liverpool	E. W. Miskall, M.D.	Health commissioner.
Elyria	G. E. French, M.D.	Do.
Euclid	*Robert Lockhart, M.D.	District health commissioner.
Findlay	*Marthy Laffey, R.N.	Health commissioner.
Fostoria	*L. W. Gibson	Do.
Fremont	E. L. Vermilya, M.D.	Do.
Garfield Heights	*Robert Lockhart, M.D.	District health commissioner.
Hamilton	*C. J. Baldrige, B.L., M.D.	County health commissioner.
Ironton	H. S. Allen, M.D.	Health commissioner.
Lakewood	Wallace J. Benner, M.D.	Commissioner of health.
Lancaster	Clifford B. Snider, M.D.	Health commissioner.
Lima	James B. Poling, M.D.	Do.
Lorain	Valloyd Adair, M.D.	Do.
Mansfield	*J. H. Hayes, M.D.	Do.
Marietta	J. B. McClure, M.D.	Do.
Marion	Kenneth D. Smith, M.D.	Do.
Martins Ferry	*John Donovan	Do.
Massillon	*John H. Williams	Do.
Middletown	*George D. Lummis, M.D.	Do.
New Philadelphia	*Joseph Blickensderfer, M.D.	Do.
Newark	W. H. Knauss, M.D.	Do.
Niles	W. A. Werner, M.D.	Do.
Norwood	L. O. Saur, M.D.	Do.
Painesville	*Clara Carter Wilder, R.N.	Commissioner of health.
Parma	*Robert Lockhart, M.D.	Health commissioner.
Piqua	L. G. Whitney	Do.
Portsmouth	O. D. Tatjo, M.D.	Do.
Salem	R. T. Holzbach, M.D.	Do.
Sandusky	*F. M. Houghtaling, M.D.	Do.
Shaker Heights	Paul Marcus Spurney, M.D.	Director of health.
Springfield	*Oscar Millson Craven, M.D.	Director of public health.
Steuensville	*Julius A. Fizzoferrato	City health commissioner.
Struthers	Charles Scofield, M.D.	Health commissioner.
Tiffin	J. A. Gosling, M.D.	Do.
Toledo	*Walter S. Holley, M.D.	Commissioner of health.
Warren	M. T. Knappenberger, M.D.	Health commissioner.
Wooster	*Wm. G. Rhoten, M.D.	Do.
Xenia	A. D. De Haven, M.D.	Do.
Youngstown	C. H. Beight, M.D.	Commissioner of health.
Zanesville	Edmund R. Brush, M.D.	Health commissioner.
Oklahoma:		
Ada	M. M. Webster, M.D.	City health officer.
Ardmore	A. Y. Easterwood, M.D.	City physician.
Bartlesville	Elizabeth Chamberlin, M.D.	City superintendent of health.
Chickasha	E. L. Dawson, M.D.	Do.
Enid	R. C. Baker, M.D.	Do.
Lawton	Fratls Duff	City chemist.
McAlester	*Chas. M. Pearce, M.D.	Superintendent of health.
Muskogee	L. S. McAlester, M.D.	City physician.
Oklahoma City	*Walter H. Miles, M.D.	Director of health.
Oklmulgee		
Ponca City		
Sapulpa	*A. C. Frampton	Dairy and health inspector.
Seminole		
Shawnee	H. G. Campbell, M.D.	City physician.

City	Name of health officer	Official title
Oklahoma—Continued.		
Tulsa.....	J. Jeff Billington, M.D.....	Superintendent of health.
Wewoka.....	Geo. Hunter, M.D.....	Health officer.
Oregon:		
Astoria.....	Nellie S. Vernon, M.D.....	City and county health officer.
Eugene.....	*Ronald C. Romig, M.D.....	County health officer.
Klamath Falls.....	A. A. Soule, M.D.....	Health officer and city physician.
Medford.....	L. D. Inskoop, M.D.....	City health officer.
Portland.....	*John G. Abale, M.D.....	Do.
Salem.....	*Vernon A. Douglas, M.D.....	City and county health officer.
Pennsylvania:		
Aliquippa.....	*James E. Tanner.....	Health officer.
Allentown.....	*J. Treichler Butz, D.D.S., M.D.....	Do.
Altoona.....	*T. G. Herbert.....	Superintendent, bureau of health.
Ambridge.....	*Louis Herrmann.....	Health officer.
Arnold.....	A. B. Bishop.....	Do.
Beaver Falls.....	*Nelson W. Osmond.....	Health officer and plumbing inspector.
Bellevue.....	*James B. Arthur.....	Health officer.
Berwick.....	*Charles Ross.....	Do.
Bethlehem.....	F. J. Conahan, M.D.....	City physician.
Braddock.....	*James E. Wills.....	Health officer.
Bradford.....	*R. G. Vogel.....	Do.
Bristol.....	John M. Wright.....	Do.
Butler.....	*J. Fred Leetch.....	Do.
Canonsburg.....	*Frank Milligan.....	Do.
Carbondale.....	*Paul Nelson.....	Sanitary officer.
Carlisle.....	*U. Grant-Eppley.....	Health officer.
Carnegie.....	Jos. Lewis.....	Do.
Chambersburg.....	*Frank J. Croft.....	City health officer.
Charleroi.....	*J. M. Hill.....	City health officer and inspector.
Chester.....	*Timothy McCarey.....	Health officer.
Clairton.....	*F. F. Keller.....	Do.
Coatesville.....		
Columbia.....	George M. Rodenbauer.....	Do.
Connellsville.....	*D. E. Miner.....	Health officer and sealer of weights and measures.
Conshohocken.....	Thomas S. White.....	Health officer and secretary.
Coraopolis.....	F. H. Stark.....	Health officer.
Dickson City.....		
Donora.....	*Herman Lang.....	Do.
Dormont.....	Henry Chrystal.....	Do.
Du Bois.....	J. I. Brockbank, M.D.....	Do.
Dunmore.....	*William Ferrese.....	Do.
Duquesne.....	*C. W. Goldstrohm.....	Do.
Easton.....	Joseph Samuel Cohen, M.D.....	City health officer.
Ellwood City.....	*Lewis Young.....	Do.
Erie.....	*J. R. Smith, M.D.....	Health officer.
Farrell.....	*Katherine M. Daly.....	Do.
Franklin.....		
Greensburg.....	*T. Ray Hunter.....	Do.
Hanover.....	*F. Y. Stambaugh.....	Do.
Harrisburg.....	John M. J. Raunick, M.D.....	Do.
Hazleton.....	*William Pfaff.....	Do.
Homestead.....	*M. D. Weis.....	Do.
Jeanette.....	*Chas. E. Walter.....	Chief health officer.
Johnstown.....	L. W. Jones, M.D.....	Health officer.
Kingston.....	*J. F. Seward.....	Do.
Lancaster.....	*Benj. F. Charles.....	Do.
Latrobe.....	W. T. Osborne.....	Do.
Lebanon.....	John D. Bogen, M.D.....	Do.
Lewistown.....	H. E. Fetterolf.....	Do.
McKeesport.....	*Daniel F. Marsh.....	Do.
McKees Rocks.....		
Mahanoy City.....	*Harry Martin.....	Do.
Meadville.....	*John L. Laley.....	Do.
Monessen.....	*Francis E. Gibson.....	City health officer.
Mount Carmel.....	*Charles F. Cohoon.....	Health officer.
Munhall.....	Charles Watts.....	Do.
Nanticoke.....	*H. J. Abbott.....	Do.
New Castle.....	William L. Steen, M.D.....	Do.
New Kensington.....	*John H. Evans.....	Ordinance and health officer.
Norristown.....	*R. Ronald Dettre.....	Health officer.
North Braddock.....	*George A. Shephard.....	Do.
Oil City.....	*William J. Lewis.....	Do.
Old Forge.....		
Olyphant.....		

City	Name of health officer	Official title
Pennsylvania—Continued.		
Philadelphia:		
Department of public health.	*J. Norman Henry, M.D.	Director, department of public health.
Bureau of health.	*George A. Knowles, M.D.	Assistant director, department of public health.
Bureau of hospitals:	*William J. Wolf.	Secretary.
Philadelphia General Hospital, 34th and Pine Streets.	*William G. Turnbull, M.D.	Superintendent.
Philadelphia Hospital for Contagious Diseases, 2nd and Luzerne Streets.	*Pascal F. Lucchesi, M.D.	Acting superintendent.
Philadelphia Hospital for Mental Diseases, Byberry.	*James P. Sands, M.D.	Superintendent.
Phoenixville.	*Russell E. Deery.	Health officer.
Pittsburgh.	*W. W. McFarland, M.D.	Director, department of public health.
Bureau of infectious diseases (including municipal and tuberculosis hospitals).	*P. E. Marks, M.D.	Superintendent.
Bureau of sanitation.	*Charles Parkinson.	Do.
Bureau of child welfare.	*H. J. Benz, M.D.	Do.
Bureau of food inspection.	*J. C. McNeil, V.M.D.	Do.
Bureau of smoke regulation.	*H. B. Meller, C.E.	Do.
Pittston.	*Michael A. McHale.	Health officer.
Plymouth.	*H. G. Templeton, M.D.	Secretary, board of health.
Pottstown.	*A. John André.	Health officer.
Pottsville.	*A. C. Huntzinger.	Do.
Reading.	*Ira J. Hain, M.D.	Do.
Scranton.		
Shamokin.		
Sharon.	*J. S. Hildebrand.	Sanitary officer.
Shenandoah.	*Joseph McLuskey.	Health officer.
Steelton.	*E. G. Butler.	Do.
Sunbury.	*Victor A. Koble.	Do.
Swissvale.	*William H. Rushworth.	Do.
Tamaqua.	Isamont Perrine.	Constable.
Taylor.	E. E. Edwards, M.D.	Health officer.
Turtle Creek.	*Manuel Emmanuel.	Do.
Uniontown.	W. C. Hall.	City health officer.
Vandergrift.	J. D. Remaley.	Health officer.
Warren.	*R. N. Brown.	Do.
Washington.	*Thomas W. Henderson.	Secretary, board of health.
Waynesboro.	*Percy H. Snowberger.	Health officer.
West Chester.	William A. Linberger, M.D.	Secretary, board of health.
Wilkes-Barre.	*Charles B. Crittenden, M.D.	Principal health officer.
Wilksburg.	*J. M. Snyder.	Health officer.
Williamsport.	*William J. Mollenkopf.	Do.
York.	*J. Frank Small, M.D.	Director of public health.
Rhode Island:		
Bristol.	Daniel E. Dwyer.	Health officer.
Central Falls.	Charles S. Doucet, M.D.	Health superintendent.
Cranston.	Daniel S. Latham, M.D.	Superintendent of health.
East Providence.	W. H. T. Hamill, M.D.	Health officer.
Newport.		
North Providence.		
Pawtucket.	Albert L. Vandale, M.D.	Superintendent of health.
Providence.	*Dennett L. Richardson, M.D.	Do.
Warwick.	*Lawrence Jackson Smith, M.D.	Do.
West Warwick.		
Westerly.	Samuel C. Webster, Ph.G., M.D.	Do.
Woonsocket.	Thomas S. Flynn, M.D.	Health officer.
South Carolina:		
Anderson.	*E. E. Epting, M.D.	City and county health officer.
Charleston.	*Leon Banov, M.D.	City-county health officer.
Columbia.	*Paul Eugene Payne, M.D.	Health officer.
Florence.	*George Dawson Heath, M.D. Dr. P.H.	Health commissioner.
Greenville.	*Irving Sydnor Bardsdale, M.D.	Commissioner of health.
Greenwood.	*Joseph E. Brodie, M.D.	County health officer.
Rock Hill.	R. D. Sumner, M.D.	Medical officer.
Spartanburg.		
Sumter.	*S. R. Kitchen, D.V.M.	City health officer.
South Dakota:		
Aberdeen.	J. F. Adams, M.D.	Do.
Huron.	William H. Saxton, M.D.	City physician.
Mitchell.	E. M. Young, M.D.	City health officer.
Rapid City.	*F. S. Austin, M.D.	County health officer.
Sioux Falls.	W. E. Donahoe, M.D.	Health officer.
Watertown.	W. G. Magee, M.D.	City health officer.

City	Name of health officer	Official title
Tennessee:		
Bristol	*F. L. Moore, M.D.	Director, county health department.
Chatanooga	*Fred C. McIsaac, M.D.	Director of health.
Jackson	Herman Hawkins, M.D.	City physician.
Johnson City	*W. L. Poole, M.D., M.P.H.	Director, health department.
Kingsport	H. W. Longworth, M.D.	City physician.
Knoxville	*William H. Enneis, M.D., M.P.H.	Health officer.
Memphis	*L. M. Graves, M.D.	Superintendent, health department.
Nashville	*John Overton, M.D.	City health officer.
Texas:		
Abilene	Scott W. Hollis, M.D.	Health officer.
Amarillo	*B. M. Primer, M.D., M.P.H.	Director, county health unit.
Austin	Eugene O. Chimene, M.D.	Director, city-county health unit.
Beaumont	Fred Colby, M.D.	City health officer.
Big Spring	M. H. Bennett, M.D.	Do.
Brownsville	Thurman A. Kinder, jr., M.D.	Do.
Brownwood	H. L. Locker, Ph.G., M.D.	Do.
Cleburne	Joseph M. Stallicup, M.D.	Do.
Corpus Christi	N. D. Carter, M.D.	Do.
Corsicana	W. D. Cross, M.D.	Do.
Dallas	*J. W. Bass, M.D.	Director of public health.
Del Rio	W. R. McWilliams, M.D.	City health officer.
Denison	W. A. Lee, M.D.	Do.
El Paso	*T. J. McCamant, M.D.	Director, city-county health unit.
Fort Worth	*A. H. Flickwir, M.D.	Director, public health and welfare.
Galveston	Walter Kleberg, M.D.	City health officer.
Greenville	B. F. Arnold, M.D.	Do.
Harlingen	V. M. Bass, M.D.	Do.
Houston	*George Washington Larendon, M.D.	Director of public health.
Laredo	H. M. Austin	City health officer.
Lubbock	J. W. Rollo	Do.
Marshall	Galen Eads	Do.
Palestine	J. M. Colley, M.D.	Do.
Pampa	Archie Cole, M.D.	Do.
Paris	John A. Stephens, M.D.	Do.
Port Arthur	F. J. Beyt, M.D.	Do.
San Angelo	B. T. Brown, M.D.	Do.
San Antonio	*W. A. King, M.D.	Do.
San Benito	Neal D. Monger, M.D.	Do.
Sherman	J. H. Carraway, M.D.	Do.
Sweetwater	*Ernest W. Prothro, M.D.	Director of public health.
Temple	Robert R. Curtis, M.D.	City health officer.
Texarkana	Joe Ellis Tyson, M.D.	Do.
Tyler	Albert Woldert, Ph.G., M.D.	Do.
Waco	R. W. Crosthwait, M.D.	Health officer.
Wichita Falls	*Robert B. Wolford, M.D.	City health officer.
Utah:		
Ogden	N. H. Savage, M.D.	City physician.
Provo		
Salt Lake City	L. E. Viko, M.D.	Health commissioner.
Vermont:		
Barre	Michael F. Cerasoli, M.D.	Health officer.
Bennington	*Joseph M. Ayres	Do.
Burlington	Erald F. Foster, M.D.	City health officer.
Rutland	*Clare M. Cole	Health officer.
Virginia:		
Alexandria	*W. Lewis Schaefer, M.D.	Health officer and clinician.
Charlottesville	*E. L. McQuade, M.D., Dr. P.H.	Health officer.
Danville	*R. W. Garnett, M.D.	Do.
Hopewell	L. A. Sims	City engineer.
Lynchburg	*Mosby G. Perrow, Ph.D.	Director of public welfare.
Newport News	*G. Colbert Tyler, M.D.	Health officer.
Norfolk	*Powhatan S. Schenck, M.D.	Health commissioner.
Petersburg	Mason Romaine, M.D.	Health officer.
Portsmouth	*Lonsdale J. Roper, M.D.	Director of public welfare.
Richmond	*W. Brownley Foster, M.D.	Do.
Roanoke	*Coleman Bernard Ransone, M.D.	Health officer.
Staunton	F. M. Carroll, M.D.	Do.
Suffolk	*Challis Haddon Dawson, M.D.	Director of Health.
Winchester	L. M. Allen, M.D.	Health officer.
Washington:		
Aberdeen	B. O. Swinehart, M.D.	City health officer.
Bellingham	Isaac W. Powell, M.D.	Do.
Bremerton	David H. Polk, M.D.	Do.
Everett	I. W. Parsons, M.D.	Health officer.
Hoquiam	John W. Stevenson, M.D.	City health officer.
Longview	J. S. McCarthy, M.D.	Do.
Olympia	W. L. Bridgford, M.D.	Do.
Port Angeles	Wm. H. Taylor, M.D.	Do.
Seattle	*F. M. Carroll, M.D.	Commissioner of health.
Spokane	*Ralph Hendricks, M.D.	Health officer.
Tacoma	Samuel Morton Creswell, M.D.	Director of health.
Vancouver	*George H.T. Sparling, M.D.	Do.
Walla Walla	*J. E. Vanderpool, M.D.	City-county health officer.

City	Name of health officer	Official title
Washington—Continued.		
Wenatchee	*C. R. Fargher, M.D.	Health officer and county physician.
Yakima	*Lloyd Moffitt, M.D.	City health officer.
West Virginia:		
Bluefield	*David B. Lepper, M.D., C.P.H.	City health director.
Charleston	*Hugh B. Robins, M.D.	Health commissioner.
Clarksburg		
Fairmont	*J. H. Jamison, M.D.	City health officer.
Huntington	*W. M. York, M.D.	Health commissioner.
Martinsburg	*Edwin Cameron, M.D.	Health officer.
Morgantown	*R. C. Farrier, M.D.	County health officer.
Moundsville	*Wm. G. C. Hill, Ph.G., M.D.	County health director.
Parkersburg	*Arthur D. Knott, M.D., D.P.H.	City and county health officer.
Wheeling	*Reece M. Pedicord, M.D.	City health commissioner.
Wisconsin:		
Appleton	Frank P. Dohearty, M.D.	Health officer.
Ashland	*Henry Wolfman	Do.
Beloit	H. O. Delaney, M.D.	Do.
Cudahy	Bernard Krueger, M.D.	Do.
Eau Claire	L. H. Flynn, M.D.	Do.
Fond du Lac	*Ewald H. Pawsat, M.D.	Do.
Green Bay	Henry S. Atkinson, M.D.	Health commissioner.
Janesville	Fred B. Welch, M.D.	Health officer.
Kenosha	*G. Windesheim, M.D.	Director of health.
La Crosse	*Anthony M. Murphy	Health officer and acting commissioner.
Madison	*F. F. Bowman, B.L., M.D.	Health officer.
Manitowoc	George M. Hoffman, M.D.	Commissioner of health.
Marinette	J. Wm. Boren, M.D.	Health commissioner.
Milwaukee	*John P. Koehler, M.D.	Commissioner of health.
	E. V. Brumbaugh, M.D.	Deputy commissioner of health.
School hygiene division	*George P. Barth, M.D.	Director.
Division of venereal diseases.	*William J. McKillip, M.D.	Do.
Vital statistics.	*George E. Adams	Deputy registrar.
Division of tuberculosis.	*George R. Ernst, M.D.	Director.
Contagious disease division.	*Robert E. Hickey, M.D.	Do.
Division of food and sanitary inspection.	*Stanley Pilgrim, M.D.C.	Do.
Bureau of laboratories.	*R. W. Cunliffe	Do.
Division of child welfare.	*E. V. Brumbaugh, M.D.	Do.
Division of nurses.	*Alma Brunk, R.N.	Do.
Oshkosh	*J. J. Kronzer, M.D.	City physician and health commissioner.
Racine	*I. F. Thompson, M.D., M.P.H.	Commissioner of health.
Sheboygan	*Gustav J. Hildebrand, M.D.	Commissioner of public health.
Shorewood	Roy W. Benton, M.D.	Health commissioner.
South Milwaukee	Joseph Grimm, M.D.	Do.
Stevens Point	Ferdinand R. Krembs, M.D.	Health officer.
Superior	*P. G. McGill, M.D.	Health commissioner.
Two Rivers	Alfred P. Zlatnik, M.D.	Commissioner of health.
Watertown	F. C. Hansy, M.D.	Health commissioner.
Waukesha	F. M. Schæle, M.D.	Do.
Wausau	*L. F. Bugbee	Health officer.
Wauwatosa	E. F. Peterson, Ph.G., M.D.	Health commissioner.
West Allis	*Charles S. Stern, M.D.	Commissioner of health.
Wyoming:		
Casper	J. C. Kamp, M.D.	County health officer.
Cheyenne	G. M. Anderson, M.D.	Do.

COURT DECISION RELATING TO PUBLIC HEALTH

Refusal of permit and license for live poultry market upheld.—(New Jersey Supreme Court; *Roich v. Board of Commissioners of Union City et al.*, 168 A. 165; decided Aug. 29, 1933.) The relator sought a writ of mandamus to compel the issuance of a permit and license to operate a live poultry market in Union City. By ordinance the health officer was vested with discretion in granting a permit and, without such permit, no license could be granted. No licenses, except renewals, had been granted since the adoption some years before of commission government, as live poultry markets were not favorably regarded by the health officer because of the stench and vermin

incident thereto. In upholding the refusal of a permit and license the supreme court said:

It seems that the board of commissioners may very well refuse to issue new permits for what they believe to be an unnecessary and an unsanitary business. Because there are some poultry markets which have been conducted for a long time is no reason for the allowance of others, even though the effect of the action may be that fewer persons may engage in the business.

As before indicated, the granting of the permit and license rests in the sound discretion of the health officer and the board of commissioners, and there is nothing in the record to indicate that they have abused that discretion.

DEATHS DURING WEEK ENDED JAN. 13, 1934

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

	Week ended Jan. 13, 1934	Correspond- ing week 1933
Data from 86 large cities of the United States:		
Total deaths.....	9, 169	9, 690
Deaths per 1,000 population, annual basis.....	12.8	13.5
Deaths under 1 year of age.....	616	710
Deaths under 1 year of age per 1,000 estimated live births.....	57	61
Deaths per 1,000 population, annual basis, first 2 weeks of year.....	12.9	13.6
Data from industrial insurance companies:		
Policies in force.....	67, 359, 046	69, 167, 602
Number of death claims.....	15, 805	17, 306
Death claims per 1,000 policies in force, annual rate.....	12.2	13.0
Death claims per 1,000 policies, first 2 weeks of year, annual rate.....	10.0	10.8

¹ Data for 81 cities.

PREVALENCE OF DISEASE

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

UNITED STATES

CURRENT WEEKLY STATE REPORTS

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

Reports for Weeks Ended Jan. 20, 1934, and Jan. 21, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 20, 1934, and Jan. 21, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933
New England States:								
Maine.....			2	994	8	1	1	0
New Hampshire.....	1	1			70	1	0	0
Vermont.....	1	2			25	3	0	0
Massachusetts.....	16	38		293	1,441	125	3	2
Rhode Island.....	1	5		53	4	1	0	0
Connecticut.....	5	1	12	249	17	109	0	0
Middle Atlantic States:								
New York.....	58	67	122	1,312	561	1,106	3	8
New Jersey.....	14	24	29	474	218	257	1	2
Pennsylvania.....	79	134			1,420	422	4	11
East North Central States:								
Ohio.....	56	49	8	195	122	544	1	2
Indiana.....	45	51	60	220	293	16	1	5
Illinois.....	35	65	43	159	219	169	6	16
Michigan.....	18	22	4	78	36	372	1	1
Wisconsin.....	2	4	48	2,387	229	227	2	1
West North Central States:								
Minnesota.....	21	3		102	79	424	0	2
Iowa ¹	14	13	12	69	28		1	5
Missouri.....	59	32	15	87	614	86	0	5
North Dakota.....	5	7	4	2,517	242	109	1	0
South Dakota.....	2	1		57	294	4	0	0
Nebraska.....	13	15	12	11	49	20	0	1
Kansas.....	11	6	3	812	39	55	2	1
South Atlantic States:								
Delaware.....	6	2		49	91	2	0	0
Maryland ²	9	16	32	928	57	5	0	1
District of Columbia.....	20	13	3	8	137	2	0	0
Virginia.....	43	11			499	178	4	6
West Virginia.....	40	20	68	664	34	225	2	0
North Carolina.....	27	17	60	1,301	1,541	291	3	4
South Carolina.....	14	7	683	3,681	329	38	0	0
Georgia ³	11	17	79	877	667	4	0	0
Florida.....	10	10	1	76	8		0	0
East South Central States:								
Kentucky.....	12	14	4	1,042	17		0	1
Tennessee.....	20	25	103	726	587	2	2	4
Alabama ⁴	33	18	105	751	241	2	2	1
Mississippi ⁵	20	7					1	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 20, 1934, and Jan. 21, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933
West South Central States:								
Arkansas.....	7	17	43	247	313	18	0	2
Louisiana.....	32	20	7	200	25	7	1	1
Oklahoma.....	36	16	111	1,077	339	1	3	7
Texas.....	163	94	292	706	906	230	2	5
Mountain States:								
Montana.....		7	2	1,754	7	214	0	0
Idaho.....	3	6		6	51	14	0	0
Wyoming.....					16		0	0
Colorado.....	7	5		108	24	3	0	0
New Mexico.....	12	11	7	8	95	2	1	1
Arizona.....	4	3	10	18	9		2	0
Utah.....	1	2		1	768	5	0	0
Pacific States:								
Washington.....	2	10		12	355	3	0	2
Oregon.....	10	2	27	279	33	20	1	1
California.....	52	57	32	515	339	182	3	1
Total.....	1,049	967	1,943	24,763	13,496	5,499	54	101

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933
New England States:								
Maine.....	0	0	5	37	0	0	1	0
New Hampshire.....	0	0	11	20	0	0	0	0
Vermont.....	0	0	16	29	0	0	0	0
Massachusetts.....	0	0	203	334	0	0	2	0
Rhode Island.....	0	0	28	40	0	0	0	0
Connecticut.....	0	0	71	108	0	0	0	1
Middle Atlantic States:								
New York.....	0	0	583	758	0	0	8	9
New Jersey.....	0	0	194	273	0	0	5	2
Pennsylvania.....	3	0	696	958	0	0	10	5
East North Central States:								
Ohio.....	1	0	422	413	2	8	6	2
Indiana.....	1	0	200	110	3	2	3	2
Illinois.....	1	2	500	471	5	9	8	6
Michigan.....	1	0	421	421	0	0	3	5
Wisconsin.....	0	0	175	156	54	4	0	1
West North Central States:								
Minnesota.....	1	0	93	73	4	0	2	0
Iowa.....	0	0	80	43	8	23	0	2
Missouri.....	0	0	167	109	5	0	7	1
North Dakota.....	0	0	17	26	0	0	0	0
South Dakota.....	0	0	18	17	1	0	0	35
Nebraska.....	0	1	29	35	8	3	1	0
Kansas.....	0	0	133	85	0	1	0	2
South Atlantic States:								
Delaware.....	0	0	17	11	0	0	0	0
Maryland.....	0	0	83	113	0	0	1	0
District of Columbia.....	0	0	18	22	0	0	0	0
Virginia.....	1	0	97	57	0	0	5	5
West Virginia.....	1	0	128	27	0	0	3	5
North Carolina.....	1	1	78	61	0	0	5	6
South Carolina.....	0	0	6	9	0	0	4	0
Georgia.....	0	0	15	14	0	1	4	5
Florida.....	0	0	5	17	0	0	5	1
East South Central States:								
Kentucky.....	3	1	61	45	0	1	2	5
Tennessee.....	1	0	62	81	1	0	9	3
Alabama.....	1	2	29	12	2	0	6	0
Mississippi.....	0	1	19	14	1	2	2	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 20, 1934, and Jan. 21, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933
West South Central States:								
Arkansas.....	0	0	5	13	3	13	8	2
Louisiana.....	0	0	30	10	1	1	20	5
Oklahoma ⁴	0	0	22	29	5	1	3	0
Texas ¹	0	0	122	82	12	14	15	11
Mountain States:								
Montana.....	0	0	18	16	0	1	2	0
Idaho.....	0	0	14	5	1	0	1	0
Wyoming.....	0	0	2	2	7	0	0	0
Colorado.....	0	0	27	27	0	0	2	0
New Mexico.....	0	1	52	20	1	0	3	7
Arizona.....	1	2	17	14	0	0	1	0
Utah ²	0	0	8	14	7	0	1	0
Pacific States:								
Washington.....	0	0	46	37	0	6	4	0
Oregon.....	0	1	46	16	3	12	6	2
California.....	4	2	331	203	24	48	6	1
Total.....	26	14	5,420	5,496	158	150	174	141

¹ New York City only.

² Week ended earlier than Saturday.

³ Typhus fever, week ended Jan. 20, 1934, 16 cases, as follows: Georgia, 7; Alabama, 3; Texas, 6.

⁴ Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Menin- gococ- cus menin- gitis	Diph- theria	Influ- enza	Ma- laria	Mea- sles	Pel- lagra	Pollo- mye- litis	Scarlet fever	Small- pox	Ty- phoid fever
<i>December 1933</i>										
Alabama.....	1	181	258	218	337	32	3	167	4	32
Arizona.....		31	112		38		5	109	0	13
Idaho.....		1	3		72		2	43	5	10
Illinois.....	43	227	78	7	182	2	6	1,754	3	55
Iowa.....	4	56	10		143		2	350	20	16
Louisiana.....		127	47	167	18	5	5	102	34	47
Maryland.....	2	85	116	4	70	1	2	333	0	29
Michigan.....	8	85	24	2	143		2	1,390	7	50
Minnesota.....	4	43	3		178		4	262	20	15
North Carolina.....	8	271	71		2,425	12	1	502	2	18
Pennsylvania.....	12	262		1	1,308		12	1,998	0	71
Rhode Island.....	2	17			20		0	59	0	5
South Carolina.....		223	2,253	596	569	92	5	70	2	31
South Dakota.....		75	9		1,276		0	106	2	0
West Virginia.....	12	202	272		64		4	566	6	29

<i>December 1933</i>	Cases	<i>December 1933—Continued</i>	Cases	<i>December 1933—Continued</i>	Cases
Actinomycosis:		Chicken pox—Continued:		Dysentery—Continued:	
Illinois.....	1	Rhode Island.....	81	Arizona.....	3
Chicken pox:		South Carolina.....	110	Illinois (amoebic).....	94
Alabama.....	260	South Dakota.....	223	Illinois (amoebic, car- riers).....	365
Arizona.....	57	West Virginia.....	359	Illinois (bacillary).....	6
Idaho.....	36	Conjunctivitis:		Iowa.....	4
Illinois.....	2,119	Arizona.....	4	Louisiana.....	3
Iowa.....	347	Maryland.....	1	Maryland.....	13
Louisiana.....	51	Dengue:		Michigan.....	20
Maryland.....	593	Alabama.....	1	Michigan (carrier).....	1
Michigan.....	1,792	South Carolina.....	7	Minnesota (amoebic).....	19
Minnesota.....	1,123	Diarrhea: Maryland.....	9	Minnesota (bacillary).....	2
North Carolina.....	516	Dysentery:		Pennsylvania.....	17
Pennsylvania.....	3,936	Alabama (amoebic).....	7		

December 1933—Continued		December 1933—Continued		December 1933—Continued	
Dysentery—Continued.	Cases	Ophthalmia neonatorum—	Cases	Tularaemia—Continued.	Cases
West Virginia (amoebic)	1	Continued.		Louisiana	1
Favus:		Maryland	1	Maryland	17
Minnesota	1	North Carolina	2	Michigan	5
German measles:		Pennsylvania	9	Minnesota	6
Arizona	2	Rhode Island	2	North Carolina	2
Illinois	23	Paratyphoid fever:		Pennsylvania	5
Maryland	8	Illinois	4	South Carolina	3
Michigan	46	Louisiana	1	West Virginia	1
North Carolina	11	South Carolina	1	Typhus fever:	
Pennsylvania	61	Puerperal septicemia:		Alabama	59
Rhode Island	1	Illinois	5	Louisiana	3
Hookworm disease:		Pennsylvania	5	Maryland	1
Louisiana	20	Rabies in animals:		North Carolina	13
Maryland	1	Illinois	13	South Carolina	4
Impetigo contagiosa:		Louisiana	32	Undulant fever:	
Arizona	14	Maryland	2	Alabama	4
Illinois	8	South Carolina	9	Arizona	1
Iowa	1	Rabies in man:		Illinois	12
Maryland	41	Illinois	1	Iowa	5
Lead poisoning:		West Virginia	1	Louisiana	3
Illinois	4	Rocky Mountain spotted fever:		Maryland	6
Maryland	1	Pennsylvania	1	Michigan	5
Leprosy:		Maryland	2	Minnesota	6
Louisiana	1	Septic sore throat:		North Carolina	1
Lethargic encephalitis:		Arizona	1	Pennsylvania	8
Alabama	6	Illinois	17	Rhode Island	12
Illinois	9	Iowa	2	South Carolina	3
Iowa	4	Maryland	11	South Dakota	1
Maryland	1	Michigan	70	Vincent's infection:	
Michigan	8	North Carolina	13	Illinois	66
Minnesota	3	Rhode Island	1	Iowa	1
Pennsylvania	1	South Dakota	3	Louisiana	13
Rhode Island	1	Tetanus:		Maryland	13
South Carolina	8	Alabama	5	Michigan	15
Mumps:		Illinois	5	Whooping cough:	
Alabama	14	Iowa	5	Alabama	137
Arizona	5	Maryland	1	Arizona	47
Idaho	6	Trachoma:		Idaho	2
Illinois	526	Arizona	46	Illinois	824
Iowa	100	Illinois	10	Iowa	71
Louisiana	3	Minnesota	3	Louisiana	44
Maryland	76	Pennsylvania	2	Maryland	295
Michigan	371	Trichinosis:		Michigan	716
Pennsylvania	1,023	Michigan	1	Minnesota	226
Rhode Island	7	Tularaemia:		North Carolina	710
South Carolina	112	Alabama	1	Pennsylvania	1,605
South Dakota	21	Illinois	93	Rhode Island	75
West Virginia	2	Iowa	7	South Carolina	237
Ophthalmia neonatorum:				South Dakota	37
Illinois	6			West Virginia	237

¹ Delayed report.

WEEKLY REPORTS FROM CITIES

City reports for week ended Jan. 13, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0		0	1	4	1	0	0	1	11	42
New Hampshire:											
Concord	0		0	0	1	1	0	0	0	0	9
Manchester	0		0	3	3	4	0	0	0	0	15
Nashua	0		0	1	0	9	0	0	0	0	
Vermont:											
Barre	1		0	6	0	0	0	0	0	0	2
Burlington	2		0	1	0	3	0	0	0	7	7
Massachusetts:											
Boston	2		0	245	29	67	0	10	1	67	260
Fall River	1		0	0	3	5	0	1	0	4	36
Springfield	0		0	4	1	4	0	1	0	9	30
Worcester	0		0	203	11	9	0	3	0	21	64
Rhode Island:											
Pawtucket	0		0	0	0	0	0	0	0	0	19
Providence	1		0	1	11	13	0	0	0	19	81

City reports for week ended Jan. 13, 1934—Continued

State and city	Influenza		Meas- les cases	Pneu- monia deaths	Scar- let fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes	
	Diph- theria cases	Cases									Deaths
Connecticut:											
Bridgeport.....	0	3	2	4	3	5	0	1	0	1	45
Hartford.....	1		0	0	2	8	0	2	0	2	53
New Haven.....	0		0	0	8	3	0	3	0	2	61
New York:											
Buffalo.....	3	1	4	156	12	31	0	6	0	27	143
New York.....	36	16	13	29	183	254	0	94	3	144	1,676
Rochester.....	0		0	1	4	22	0	0	0	5	84
Syracuse.....	0		0	0	11	8	0	2	0	45	52
New Jersey:											
Camden.....	1	1	0	9	7	10	0	0	0	1	41
Newark.....	1	6	0	5	10	19	0	8	0	26	96
Trenton.....	0	2	0	1	5	11	0	2	0	6	53
Pennsylvania:											
Philadelphia.....	6	11	4	498	55	83	0	23	1	71	502
Pittsburgh.....	7	3	3	12	33	32	0	6	0	62	163
Reading.....	0		0	7	4	5	0	1	0	7	28
Scranton.....	0		0	0	0	5	0	0	0	6	
Ohio:											
Cincinnati.....	15		3	243	15	24	0	10	0	14	142
Cleveland.....	7	38	2	2	30	81	0	17	1	69	232
Columbus.....	5	1	1	1	8	23	0	1	0	10	95
Toledo.....	2	4	3	53	8	19	0	5	1	22	89
Indiana:											
Fort Wayne.....	10		0	0	4	7	0	2	0	1	25
Indianapolis.....	2		1	10	19	12	0	6	1	24	
South Bend.....	0		1	0	3	10	0	0	0	0	20
Terre Haute.....	1		0	36	3	2	0	0	0	0	11
Illinois:											
Chicago.....	2	6	6	18	75	242	0	43	4	127	772
Cicero.....	0		0	1	0	0	0	0	0	0	5
Springfield.....	1		0	0	3	4	0	0	0	1	33
Michigan:											
Detroit.....	5	4	1	9	35	97	0	13	0	63	275
Flint.....	0		0	2	10	36	0	0	0	19	34
Grand Rapids.....	0		5	0	8	16	0	3	0	1	56
Wisconsin:											
Kenosha.....	0		0	0	0	28	0	0	0	2	11
Madison.....	0		5	0	5	5	0	0	0	26	20
Milwaukee.....	1	1	1	0	10	42	0	7	0	62	107
Racine.....	0		0	0	0	9	0	0	0	5	9
Superior.....	0		0	0	0	1	0	1	0	2	7
Minnesota:											
Duluth.....	0		0	1	4	1	0	0	0	1	22
Minneapolis.....	5		1	0	17	16	0	1	0	43	119
St. Paul.....	0		0	2	15	19	0	3	1	11	69
Iowa:											
Des Moines.....	2		0	0	0	6	0	0	0	1	26
Sioux City.....	1		0	0	0	1	0	0	0	0	
Waterloo.....	0		0	0	0	0	0	0	0	3	
Missouri:											
Kansas City.....	6		0	2	22	25	0	2	0	16	105
St. Joseph.....	0		0	1	5	7	0	0	0	0	8
St. Louis.....	25	2	1	322	23	25	0	5	1	40	195
North Dakota:											
Fargo.....	0		0	134	0	0	0	0	0	9	5
Grand Forks.....	0		0	0	0	0	0	0	0	1	
South Dakota:											
Aberdeen.....	0		0	1	0	0	0	0	0	0	
Nebraska:											
Omaha.....	2		0	12	3	8	2	3	0	12	60
Kansas:											
Topeka.....	0		1	1	2	4	0	1	0	1	18
Wichita.....	0		0	4	2	11	0	4	0	6	24
Delaware:											
Wilmington.....	2		0	3	1	2	0	0	1	7	35
Maryland:											
Baltimore.....	2	9	2	15	34	59	0	16	0	114	230
Cumberland.....	2		0	0	0	2	0	1	0	0	10
Frederick.....	0		0	0	0	2	0	0	0	0	4
District of Columbia:											
Washington.....	13	5	2	101	22	16	0	12	7	18	202
Virginia:											
Lynchburg.....	0		0	0	3	1	0	0	1	0	10
Norfolk.....	1	1	0	7	0	2	0	0	0	0	39
Richmond.....	1		0	1	5	10	0	3	0	0	42
Roanoke.....	3		0	1	4	2	0	0	0	0	34

City reports for week ended Jan. 13, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
West Virginia:											
Charleston	0	1	0	0	2	3	0	1	0	0	20
Huntington	3		0	0	0	11	0	0	0	0	
Wheeling	0		0	0	3	4	0	0	0	24	12
North Carolina:											
Raleigh	0		0	1	3	6	0	2	0	18	16
Wilmington	1		0	0	3	0	0	0	0	2	8
Winston-Salem	2		0	229	1	4	0	0	0	0	13
South Carolina:											
Charleston	0	33	1	3	2	0	0	2	3	1	30
Columbia	0		0	0	0	0	0	0	0	0	6
Greenville	1		0	0	1	0	0	0	2	1	8
Georgia:											
Atlanta	5	29	0	64	13	6	0	5	0	2	77
Brunswick	0		0	13	0	0	0	0	0	0	4
Savannah	1	4	2	12	2	0	0	2	0	0	49
Florida:											
Miami	1		0	0	1	1	0	3	0	14	42
Tampa	3		0	1	2	1	0	2	0	0	31
Kentucky:											
Ashland	0			0		0	0		0	0	
Lexington	1		0	1	3	0	0	3	0	5	17
Louisville	6	1	0	1	8	18	0	2	0	1	97
Tennessee:											
Memphis	3		1	48	8	7	0	4	0	3	77
Nashville	0		0	58	0	14	0	4	1	9	46
Alabama:											
Birmingham	8	13	3	1	7	3	0	2	0	3	83
Mobile	1	1	0	3	3	1	0	1	0	2	16
Montgomery	1	1		1		1	0		0	15	
Arkansas:											
Fort Smith	0			42		0	0		0		
Little Rock	0		0	45	3	0	0	0	0	0	3
Louisiana:											
New Orleans	14	2	0	4	11	18	0	12	5	0	133
Shreveport	1		0	1	0	2	0	4	0	0	34
Texas:											
Dallas	10		0	1	15	8	0	5	1	1	70
Fort Worth	7		2	0	11	8	1	1	0	1	49
Galveston	1		0	0	2	1	0	2	1	0	16
Houston	8		1	1	9	1	1	5	0	0	70
San Antonio											
Montana:											
Billings	0		0	0	0	0	0	0	0	0	9
Great Falls	0		0	1	2	0	0	0	0	2	11
Helena	0		0	0	0	0	0	0	0	0	3
Missoula	0		0	0	0	1	0	0	0	0	1
Idaho:											
Boise	0		0	0	1	0	0	1	1	3	5
Colorado:											
Denver	0	29	2	1	12	12	3	6	1	63	105
Pueblo	0		0	0	2	2	0	0	0	4	12
New Mexico:											
Albuquerque	2		0	1	1	2	0	2	0	2	11
Utah:											
Salt Lake City	1		0	554	3	6	0	0	0	23	32
Nevada:											
Reno	0		0	0	0	0	0	0	0	0	2
Washington:											
Seattle	0			5	11	18	0	6	0	59	89
Spokane	0			316	1	1	0	1	0	0	22
Tacoma	1		0	0	2	2	0	1	0	14	28
Oregon:											
Portland	0	1	0	3	3	22	1	4	0	19	69
Salem	1	5	0	0	0	0	0	0	0	2	
California:											
Los Angeles	17	26	2	8	20	101	3	20	1	48	338
Sacramento	1	2	0	2	3	0	0	5	0	0	33
San Francisco	4	8	2	5	22	12	0	9	2	29	190

1 Imported.

City reports for week ended Jan. 13, 1934—Continued

State and city	Meningococcus meningitis		Polio- mye- litis cases	State and city	Meningococcus meningitis		Polio- mye- litis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Delaware:			
Boston.....	0	0	1	Wilmington.....	0	0	1
New York:				Tennessee:			
New York.....	4	3	1	Memphis.....	2	0	0
Syracuse.....	1	0	0	Alabama:			
New Jersey:				Birmingham.....	0	0	1
Camden.....	0	1	0	Louisiana:			
Pennsylvania:				New Orleans.....	1	0	0
Philadelphia.....	0	0	3	Washington:			
Ohio:				Seattle.....	0	0	2
Columbus.....	1	1	0	Tacoma.....	0	0	1
Illinois:				California:			
Chicago.....	8	2	0	Los Angeles.....	1	0	4
				San Francisco.....	0	0	1

Pellagra.—Cases: Boston, 1; Philadelphia, 1; Charleston, S.C., 6; Savannah, 1; Miami, 1; Mobile, 1; Montgomery 1; San Francisco, 1.

Lethargic encephalitis.—Cases: New York, 1; Philadelphia, 1; Detroit, 4; St. Joseph, 1; Atlanta, 1; Los Angeles 1.

Typhus fever.—Cases: Houston, 3.

FOREIGN AND INSULAR

CANADA

Ontario Province—Communicable diseases—5 weeks ended December 30, 1933.—The Department of Health of the Province of Ontario, Canada, reports certain communicable diseases for the 5 weeks ended December 30, 1933, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Actinomycosis.....	1	—	Paratyphoid fever.....	2	—
Cerebrospinal meningitis.....	2	1	Pneumonia.....	—	205
Chicken pox.....	1,159	—	Poliomyelitis.....	5	—
Diphtheria.....	49	4	Scarlet fever.....	767	3
Dysentery.....	1	—	Septic sore throat.....	10	—
Erysipelas.....	17	2	Syphilis.....	293	1
German measles.....	7	—	Tetanus.....	—	1
Gonorrhoea.....	338	—	Trench mouth.....	1	—
Influenza.....	25	13	Tuberculosis.....	190	61
Lethargic encephalitis.....	—	2	Typhoid fever.....	31	—
Measles.....	43	—	Undulant fever.....	4	—
Mumps.....	331	—	Whooping cough.....	290	2

Quebec Province—Communicable diseases—2 weeks ended January 13, 1934.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended January 13, 1934, as follows:

Disease	Cases	Disease	Cases
Chicken pox.....	401	Puerperal septicemia.....	1
Diphtheria.....	43	Scarlet fever.....	155
Erysipelas.....	13	Tuberculosis.....	103
German measles.....	1	Typhoid fever.....	26
Influenza.....	6	Whooping cough.....	173
Measles.....	59		

MEXICO

Matamoros—Malaria.—According to a report dated November 10, 1933, there was an epidemic of malaria in Matamoros, Mexico, and surrounding district. During the week ended November 4, 1933, 17 deaths were reported at Matamoros from malaria, or complications in which malaria was an important factor. During the year 1932, 21 deaths from malaria were reported in Matamoros, while from January 1 to November 4, 1933, 52 deaths had been reported from this disease.

The epidemic was attributed to the heavy rainfall and floods which occurred in this region during the summer and early fall of 1933. A campaign for the destruction of mosquitoes was being carried on, and quinine was being distributed by health officials.

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

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Jan. 26, 1934, pp. 128-139. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Feb. 23, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands.—During the week ended January 20, 1934, cholera was reported in the Philippine Islands as follows: Bohol Province—Antequera, 18 cases, 12 deaths; Calape, 13 cases, 14 deaths; Cortes, 12 cases, 7 deaths; Loon, 11 cases, 8 deaths; Mari-bojoc, 6 cases, 2 deaths; Tagbilaran, 5 cases, 2 deaths; Talibon, 13 cases, 10 deaths; Tubigon, 15 cases, 11 deaths. Cebu Province—Alegria, 1 case, 1 death; Argao, 1 case, 2 deaths; Carcar, 1 case, 2 deaths; Cebu City, 1 case, 1 death; Guinapilan, 1 case; Samboan, 1 case, 1 death. Occidental Negros Province—Calatraba, 6 cases, 6 deaths; San Carlos, 3 cases, 4 deaths. Oriental Negros Province—Ayuquitan, 1 case; Tanjay, 36 cases, 21 deaths.

Plague

China—Manchuria.—A report dated December 15, 1933, states that 4 new cases of plague occurred at Tungliao, Manchuria, China, on December 4, 1933, and that the total number of deaths from plague in Manchuria from the beginning of the outbreak was 1,200.

Hawaii Territory—Paauilo.—On January 13, 1934, 1 plague-infected rat was reported in Paauilo, Hamakua District, Hawaii.

Union of South Africa—Transvaal.—During the week ended December 2, 1933, 1 fatal case of plague was reported on the farm Shenfield, Transvaal Province, Union of South Africa.