PUBLIC HEALTH REPORTS

VOL. 41 JULY 23, 1926 No. 30

A STATE-WIDE SMALLPOX SURVEY IN TENNESSEE

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Smallpox has been more or less prevalent in Tennessee for a great many years, although it has not been present in severe form in recent years. In view of the increasing prevalance of the disease in 1923 and 1924 and the presence of a large nonimmune population in the State, combining to create a grave potential danger, the State Health Commissioner instituted a State-wide smallpox survey and educational and vaccination campaign early in 1925. The primary twofold purpose of the survey was to secure, directly from the field, specific information with regard to the smallpox situation throughout the State, and to bring the matter personally to the attention of the local civil and health authorities.

Tennessee has an area of 42,022 square miles. It is long and narrow, being 430 miles long (east and west) and 110 miles in width (north and south). It borders on eight States. On the basis of population, resources, and topography, it may be divided into three sections—east, middle, and west. In 1920, the population as of January 1 was 2,337,885, about one-fifth of whom were negroes, the percentage of negroes becoming progressively higher from east to west. The State has 95 counties, ranging in population from 2,600 (in the mountainous section of east Tennessee) to 58,000 (Hamilton County, exclusive of Chattanooga). In 1920, there were eight cities with 10,000 population or more, the largest being Memphis, with 162,351.

Chapter 519 of the Acts of 1905 provides for the notification and control of communicable diseases. Sections 8 and 9 of this act give to the local health officers and boards of health authority to adopt compulsory vaccination, without authorization by the State board of health, whenever such action is deemed necessary. Many cities and towns have ordinances requiring compulsory vaccination for school attendance, which, however, are not strictly enforced. Only a few counties—possibly not more than eight—have similar county regulations, which, for the most part, also lack enforcement.

One of the writers (Doctor Breeding) was detailed by the State commissioner of health to make the field investigation and State-wide educational campaign. Preparatory to this work, data were collected

relative to the smallpox situation in the State and throughout the country. A questionnaire was prepared to record the data, and a mimeographed letter addressed to school-teachers was prepared to accompany a brief article on smallpox and vaccination. The teachers were requested to read the article to the pupils. The subject of smallpox was also given publicity in the newspapers and in Health Briefs, the monthly bulletin of the State department of health, which had a selected mailing list of over 4,000 persons, including all physicians in the State.

A short time after the conclusion of the survey, a general letter of warning concerning the smallpox situation and an outline of an approved vaccination technique were sent to each health officer in the State.

The field work was begun May 18, 1925, and between that date and October 23 each of the 95 counties of the State was visited and inquiry was made concerning recent and past prevalence of smallpox, the approximate immunity status of the population, the cost of past control measures, and provisions made for prevention and control of future possible outbreaks of smallpox. With regard to the latter, special emphasis was placed upon the advisability of requiring all children to be vaccinated as a prerequisite for admission to school.

The accompanying table presents data relative to the occurrence of smallpox in Tennessee during the period 1916–1925.

Smallpox in Tennessee, 1916–1925

Year	Estimated population as of July 1	Deaths	Death rate [1] per 100,000	Reported cases	Case rate [1] per 100,000
1916	2,282,690	0	0	176	7.8
1917 [2]	2,298,460	4	0.17	1,108	48.2
1918	2,314,239	15	.65	3,217	139.0
1919	2,330,000	13	.56	1,874	80.4
1920	2,345,779	11	.47	3,002	128.0
1921	2,361,539	10	.42	2,913	123.4
1922	2,377,308	2	.08	567	23.8
1923	2,393,077	3	.13	1,037	43.3
1924	2,408,846	8	.33	3,145	130.6
1925	2,424,616	(3)		1,810	74.7
Total		[4] 66	[5] 0.31	18,851	[6] 80.1

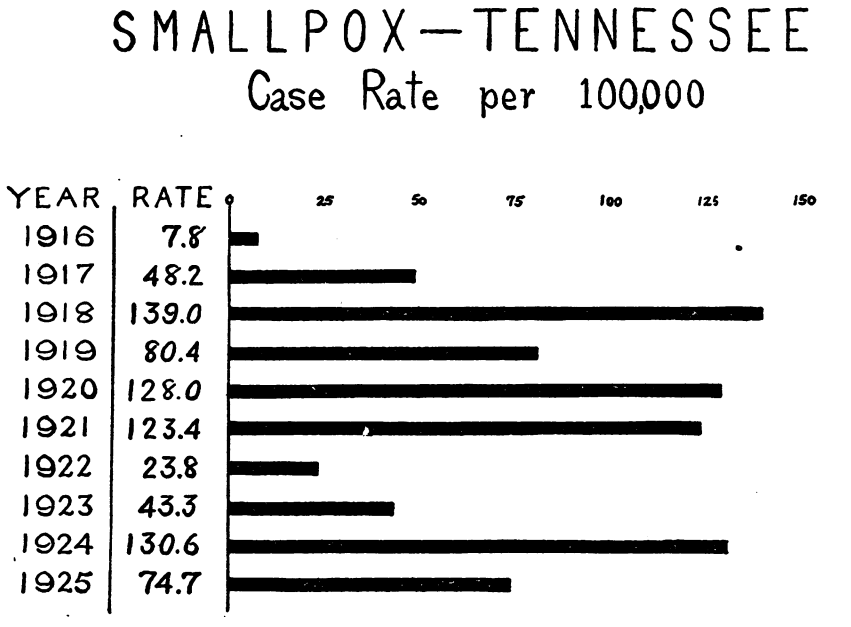
[1] Data are not available for computing rates for white and colored separately. The 1920 Federal census gave the population of the State as 1,885,993 white (80.7 per cent), and 451,758 colored (19.3 per cent). In 1910 the per cent of total for whites and colored, respectively, was 78.3 and 21.7.
[2] Admitted to the death registration area in 1917.
[3] Data not yet available.
[4] Nine years.
[5] Rate for 9-year period.
[6] Rate for 10-year period.

Incidence, 1920–1924.—Of 80 counties from which the data were obtainable, 67 reported 6,803 cases for the years 1920–1924, while 13 reported no cases. The largest number reported for any one county was 1,268; the median number reported was 27. Information was not obtainable in 11 counties, and for 4 no data are given.

Incidence in 1925.—Of 81 counties from which the information was obtained for 1925, 45 counties reported 969 cases of smallpox, the largest number for any one county being 200 cases, the median, 6 cases. Thirty-six counties reported no cases during the year.

Approximate number of vaccinations, 1920–1924.—In 73 of the counties for which information was available there were reported 110,932 vaccinations during the five years preceding the survey, the largest number for any one county being 15,000. The remaining 6 of these counties reported no vaccinations.

Cost of control measures, 1920–1924.—The total amount expended for medical service during the five-year period 1920–1924 for 38 of 50 counties for which information was available was given as $30,922.75, the largest expenditure for any one county being $7,600. The remaining 12 of these counties reported no expenses under this head.



For special quarantine, 39 of 52 counties giving the information reported $13,399.18, the largest expenditure for any one county being $1,706. Thirteen of these counties reported no expenses under this heading. These expenditures are exclusive of the salaries of the health officers.

Difficulties met with in enforcement of vaccination.—The sentiment of county officials regarding compulsory vaccination as a condition for school attendance in the absence of an epidemic was fairly evenly divided. Lawsuits as a result of complusory vaccination were reported for three counties. Sectarian opposition to vaccination was said to exist in seven counties.

The following were among the difficulties most frequently met with by the health officers in the enforcement of vaccination:

1. Ignorance and exaggerated stories of bad results following vaccination.
2. Opposition aroused by enforcing quarantine regulations.
3. General opinion that the disease is mild and is less severe than the results of vaccination.
4. Lack of aggressive support by physicians.
5. Lack of support by officials of large industries.
6. Lack of financial aid by county officials.
7. Tendency and ability of certain classes to secrete the disease.
8. False conception of personal liberty.
9. Opposition from certain religious sects.
10. Tendency of some local officials to suppress knowledge of outbreaks for commercial reasons.

RESULTS OF SURVEY

First-hand information was secured regarding the smallpox situation throughout Tennessee, the approximate number of immune persons, the cost of control measures, the sentiment of the county officials and the general population with regard to vaccination, and the difficulties most frequently encountered by health officers in the enforcement of vaccination regulations.

From an educational standpoint, the survey served to impress the gravity of the situation upon the local authorities and stimulated their interest. Although the expected increase in the incidence of smallpox over the previous year did not occur, had it occurred and had intensive control measures been necessary the educational work accomplished and the closer contact made between the State department and local health authorities would have greatly facilitated the enforcement of such measures.

CONCLUSIONS

Although the percentage of persons vaccinated in Tennessee is extremely low, it is believed that the State law empowering local boards to enact such vaccination measures as may be deemed necessary for the protection of the public is adequate for the time being. A State compulsory vaccination law, unenforceable in rural sections, might stir up such opposition as to hinder other health programs. By virtue of the present law, local officials have, in times of epidemics, enforced vaccination of contacts, of the inhabitants of a zone around the foci of infection, and of the school population with little or no opposition.

Greater reliance should, for the present, be placed on educational measures to secure more widespread vaccination. While the State health department should keep the local authorities informed and

make suitable recommendations from time to time, with a State the size of Tennessee the ultimate solution of this problem, as well as of many rural health problems, would seem to lie in the extension of wholetime county health departments. Smallpox offers no serious problem to counties with such departments.

There seems to be a growing sentiment in the medical profession of the State, and especially among health officers, that quarantine measures are often ineffectual and that persons refusing vaccination on the grounds of restriction of personal liberty or otherwise should not be compelled to subject themselves to quarantine restriction. It is argued that such a course would emphasize the importance of vaccination and encourage its practice. Until, however, we can secure vaccination of all minors and irresponsible persons, until vaccination is an equal protection against the most severe as well as the milder forms of the disease, and until vaccination becomes an absolutely reliable procedure, with the use in every case of a vaccine of unquestionable potency and the most approved technique followed by a careful reading and an accurate interpretation of the result, the elimination of the strictest possible quarantine is inadvisable.

BENZOL POISONING AS AN INDUSTRIAL HAZARD

Review of Studies Conducted In Cooperation with the Subcommittee on Benzol of the Committee on Industrial Poisoning of the National Safety Council

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VI. INTENSIVE STUDY OF SELECTED INDUSTRIES WITH RESPECT TO FACTORY CONDITIONS AND POLLUTION OF THE ATMOSPHERE BY BENZOL

A somewhat intensive study was made of a group of selected industries in which benzol was used, with a view to determining (*a*) the amount of benzol used and the precautions adopted in handling it, particularly the method of ventilation in force; (*b*) the resulting concentration of benzol in the atmosphere; and (*c*) the condition of the exposed workers as revealed by symptomatology and blood counts. The first of these studies were conducted during the summer of 1924, Mr. Dexter making the inspections and Doctor Shirley the clinical examinations. A second investigation was made during the winter of 1924–25, the writer making the inspections, and Doctor Shirley, Doctor Batchelor, and Doctor Herrman making the clinical examinations. The chemical tests were worked out and applied by the writer.

The first questionnaire as noted above gave a preliminary list of 84 firms using benzol. Later inquiries expanded this list to 104 organizations representing 125 different plants. Of these 125 plants our investigators actually visited 94, the remainder being omitted either because they were situated at too great a distance or because from what we could ascertain by correspondence they did not promise to prove useful for our purposes. Of the 94 plants visited, we were permitted to inspect 78, and from these 78 we ultimately selected 17 as suitable for intensive study. Five of these were later eliminated from consideration for various reaons, leaving 12 plants in which there was exposure of several or more workers to benzol vapors under conditions which might reasonably be expected to constitute a possible hazard; and in 18 different workrooms of these 12 plants detailed chemical and medical studies were made.

In each case the first step was to make a careful survey of existing conditions, using the inspection form reproduced below:

No.....

FIELD INVESTIGATION—BENZOL STUDY

1. City..... Establishment..... Date.....
   Type of building..... Room..... Location.....
   Size..... Crowded..... Ample.....
2. Ventilation:
   Natural.....
   Artificial.....
3. Fumes and gases noticeable.....
4. Specific poisons: Benzol. How long used..... Amount used.....
   How received..... How stored..... How distributed.....
   Nature and description of use in the particular process.....
   .....
   .....
   Type of container used.....
   Number.....Size.....(Make sketch). Open.....Covered.....Portable.....Fixed.....

   What precautions are taken while cleaning tanks or receptacles?
   What other solvents used?
   Is room separated from other processes of manufacture?

Air Test for Benzol

Test No. (1)	Tube No. (2)	Date (3)	Weight of tube: Start (4)	Weight of tube: Finish (5)	Gain in weight (mgs.) (6)

Vol. of air sample (liters) (7)	Mg./liter (8) (6÷7)	P. p. M. benzol (9) (8×313)	Temp. (10): Dry	Temp. (10): Wet	R. H. (11)	Test point (12)

5. Employees:

Occupation	Work, day or piece	Exposed to hazard: Male	Exposed to hazard: Female	Hours per day	Rest period	Medical examination

6. Fatigue:

7. Remarks:

It will be observed that under heading No. 1 certain fundamental structural data are listed. Heading 2 deals with the ventilation in use. Headings 3 and 4 deal with the fumes and vapors in the atmosphere and the shop conditions, which serve to bring about the presence of such vapors. The air sampling data were recorded under item 4 also.

Under heading 5 are grouped certain data which yield a rather general job analysis. Heading 6 provides for notes on fatigue, the purpose being an attempt to clarify the relation between heavy or light labor and the incidence of benzol poisoning. And, lastly, item 7 is for any remarks considered of value to the investigator and not provided for elsewhere. In addition to filling out this form, the investigator prepared a series of notes on each of the plants studied, in greater detail than the form permits, and covering all those factors which may have had a bearing on the problem in hand.

In spite of the fact that benzol vapors have for a long time been associated with serious cases of acute and chronic poisoning, one finds on searching the literature of this subject that only a very small amount of work has been done on the actual concentrations of benzol vapor in plant atmospheres.

Harbeck and Lunge (102) showed that it was possible to recover benzol vapor quantitatively from air by absorption in a mixture of concentrated sulphuric and fuming nitric acids. The benzol is, in this case, converted over to dinitrobenzol and is determined as such. Lehmann (103) tested this method with weighed quantities of benzol and obtained a recovery of 92 to 95 per cent. He also used this method with certain paraffin oil modifications and obtained yields of 94.4 to 100 per cent.

Using the method of nitrification for benzol determinations, Lehmann (3) found that 0.015 gram per liter (4,700 parts per million) produces listlessness and confusion after half an hour, and that 0.02 to 0.03 gram (6,260 to 9,390 parts per million) for a few hours may cause loss of consciousness. In this same contribution Lehman (3) quotes some of the earliest, if not the earliest, figures for the benzol concentration in factory air. He utilized the method of converting the benzol to dinitrobenzol as described earlier and found 0.080 to 0.094 milligram per liter (25 to 29 parts per million) in the air of a benzol washing plant, 0.11 to 0.16 milligram per liter (34 to 50 parts per million) in the air of a distillation plant, 0.19 to 0.34 milligram per liter (59 to 106 parts per million) at various stations in two benzol plants.

Albaugh (32) quotes the limits of toxicity of benzine, benzol, and turpentine as follows:

Benzine (naphtha, gasoline, petroleum benzine):
0.02 gram per liter (6,260 parts per million) causes local symptoms.
0.05 gram per liter (15,650 parts per million) is poisonous.

Benzol:

0.015 gram per liter (4,695 parts per million) is poisonous.

0.042 gram per liter (13,146 parts per million) will kill dogs in 20 minutes:

Turpentine:

0.003 gram per liter (919 parts per million) causes local symptoms.

0.006 gram per liter (1,878 parts per million) will poison healthy men in 1 to 4 hours.

Albaugh does not cite the methods used for the determination of benzol or the source of these data.

Major Elliot and Captain Dalton (104), in studying the problem of the concentration of acetone, alcohol, and benzene in air, rejected the method based on nitration of the benzol with subsequent reduction, diazotisation, and combination with α naphthol to form a dye. This method was considered to be more complicated than Pfeiffer's method (105), and for this reason Pfeiffer's method was adopted. Elliot and Dalton passed the air through 15 cubic centimeters of a mixture of equal volumes of fuming nitric acid and strong sulphuric acids. By further chemical procedures, dinitrobenzol was recovered and dissolved in alcohol, which was then heated with a solution of stannous chloride and the excess titrated with N/10 iodine, using starch as an indicator. They found a minimum of 0.01, an average of 0.26 and a maximum of 0.90 gram of benzene per million cubic centimeters of factory air. These figures, when converted, yield 3.1, 81.5, and 281 parts per million, respectively.

According to Hamilton (53), Pugliese (61) tested the air of the Milan raincoat factory in which three girl workers died from benzol poisoning one winter, and found that the air contained 1,000 parts of benzol per million. The method for the determination of benzol is not given. This quantity would, according to our experience, probably yield cases of benzol poisoning. Pugliese feels that by allowing sufficient space for each worker and ample ventilation, benzol poisoning should be easily avoided. He considered the conditions at the Pirelli works satisfactory, where each worker had over 1,500 cubic feet of space and over 1,600 cubic feet of forced air supply per minute.

Doctor Legge (54) cites the results of benzol determination made in the atmosphere of a balloon fabric spreading room. In this case the quantity of benzol vapor in the air ranged from 210 parts per million in the middle of a corridor opposite a machine to 1,050 parts per million in front of a fan between two spreading machines at work. In the pneumatic-tire manufacturing room analyses showed 2,800 parts per million with the windows open, whereas with the exhaust fan in operation a sample taken 18 inches from the work showed 800 parts per million. The method used for the determination of the benzol vapors is not given.

One of the most complete papers dealing with the determination of benzol with which the present investigators are familiar is that of Tausz (106). The work of this investigation, carried on purely from the point of view of the chemical determination of benzol in coke oven and illuminating gas, is valuable because of the very extensive review of methods for the determination of benzol presented therein. Practically every suggested method for the determination of benzol is reviewed in this paper and the author concludes that the method of activated charcoal is superior to all others. Using less than 1 cubic centimeter of benzol the author was able to obtain a yield of from 91 to 93 per cent, and this in a relatively short time and by simple analytical procedures.

In considering the methods for the determination of the benzol content of factory air the present investigation took into consideration all of the available literature, bearing in mind the fact that the method to be employed must be simple, the apparatus portable, and the analyses must be made in a comparatively short time. It was concluded that the activated charcoal procedure was the method of choice for the problem at hand. It is true that silica gel might have served the purpose; but with this substance it is necessary to use such precautions against the absorption of water vapor that it was decided not to use it. Before finally selecting the charcoal method, its accuracy was determined by vaporizing a weighed quantity of benzol and determining the increase in weight of the tube of activated charcoal. In these experiments there was recovered an average of 92 per cent of the benzol introduced into the gas chain when sampling was conducted at the rate of 1 liter per minute. This means that the observed results are to be considered as approximately 8 to 10 per cent lower than the actual existing conditions. A difference of this amount is, however, not significant from the standpoint of this investigation. It is not a matter of whether there are 90 or 100 parts per million of benzol vapor in the air, but rather whether there are 50, 100, 200, 300, 500, 1,000, etc., parts per million present. When one bears in mind the fact that, under plant conditions, particularly in the summer season when windows are open and natural ventilation is good, the benzol vapor concentration in the workroom is subject to great and almost continuous variations, errors of 10 per cent are obviously of no serious significance.

Since activated charcoal also absorbs a certain amount of moisture, it was necessary to take suitable precautions to render the sampled air moisture-free before passing it into the charcoal absorption tube. The finished apparatus (shown in fig. 1) consisted of a carrying case, 14 by 15 by 15 inches, provided with a series of clamps for holding three tubes, the first two of which were 10 inches by 1 inch

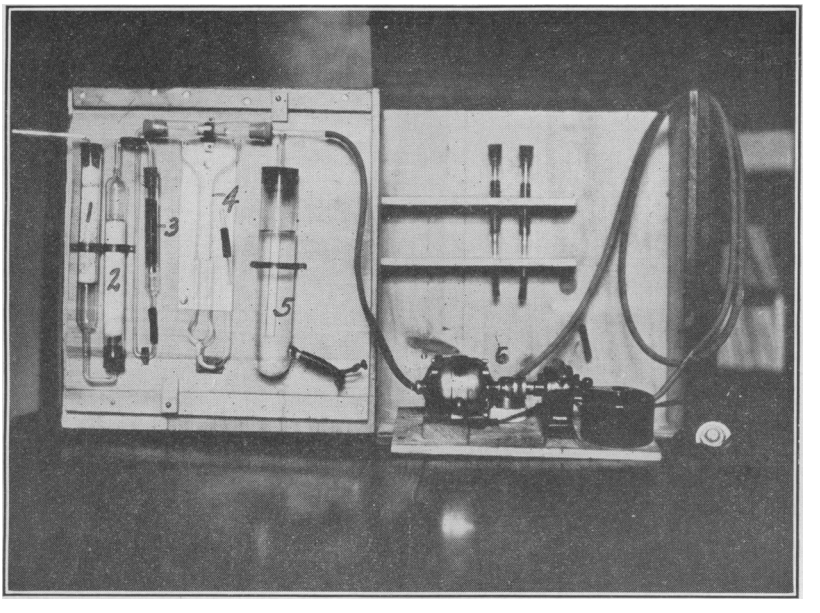

Fig. 1.—Apparatus for sampling vapors in the air. 1, Soda lime tube; 2, calcium chloride tube; 3, activated charcoal tube; 4, flow meter; 5, pressure regulator; 6, motor blower unit

and the last 6½ inches by ⅝ inch. The first tube was filled with soda lime for absorption of acid vapors, the second with calcium chloride for absorption of the water vapor, and the last tube with approximately 7 grams of 8 to 14 mesh activated charcoal.

Before filling the absorption tubes, the charcoal was dried over night in a constant temperature oven at 105° C. and kept in a tightly stoppered glass bottle. It was found advantageous to cover the retainer plate of the charcoal tubes with a piece of fine mesh copper gauze, which served to prevent any large grains of charcoal from falling through the plate. The tubes were then clamped in position beneath the stem of a small funnel, and the lower end of the tube was connected to a large bottle (7 liters capacity) by means of a piece of rubber tubing. The charcoal was then dropped, by means of a spatula, into the small funnel, from which it fell into the tube. After filling the tube in this manner, the stopcock between the tube and suction bottle was opened and closed several times. This procedure serves to remove the fines from charcoal tubes, which were never "tapped" during the process of filling. The foregoing method is the standard procedure recommended by the United States Bureau of Mines for the preparation of activated charcoal gas absorption tubes.

It was also found necessary to equilibrate the charcoal tubes before use. This process consisted in connecting six charcoal tubes in parallel by means of a manifold made of glass tubing and connecting the manifold to the outlet side of the calcium-chloride tube. A tube of cotton wool was also added in the air chain in front of the soda-lime tube. Compressed air was then passed through the chain, which was composed of the following elements: Cotton-wool tube, soda-lime tube, calcium-chloride tube, manifold, and six charcoal tubes. The compressed air, at the rate of approximately 6 liters per minute, was allowed to flow through the chain of one and one-half to three hours, and on the completion of this step the charcoal tubes were desiccated over calcium chloride and later weighed. After the tubes were equilibrated in this manner it was found that the aspiration of ordinary room air through the sampling chain failed to produce any significant change in the weight of the charcoal tubes. Prior to going into the field, a sufficient number of charcoal tubes were prepared in the previously described method and placed in the rack of the carrying case provided for this purpose. At the selected point of the workroom the sampling apparatus was set up and the outlet end of the absorption tube connected to a 7-liter aspirator bottle, previously filled with water, which, when allowed to flow from the aspirator bottle, drew air through the gas chain. After a sufficient volume of air had been sampled, usually 20 liters, the charcoal tube was removed from the chain, stoppered at the top,

plugged at the bottom, and returned to the rack. On returning from the field the tubes were dusted with a camel's-hair brush, desiccated, and weighed, the increase in weight being taken to represent the approximate amount of solvent vapors in the atmosphere sampled. In those plants using benzol as the only solvent, this increase in weight represents that due to benzol vapors only.

It must be emphasized, however, that the method of analysis used is not specific for benzol, since the charcoal absorbs not only this substance but other solvent vapors as well. In the accompanying tables it is indicated whether other solvent vapors were present or not, and it will be noted that they were present in nine of the workrooms. In these instances, then, the figures for atmospheric pollution include all solvent vapors and not merely benzol; but since these tests were made chiefly as an index of the protection against atmospheric pollution by the ventilation equipment present, the results are believed to serve the purpose in a sufficiently satisfactory degree.

The general results of these studies on the extent of atmospheric pollution in workroom air are presented in Table 4. They cover 18 different workrooms which are fairly representative of the various processes in which benzol is used in the rubber, patent leather, and artificial-leather industries, in wire insulating, dry cleaning, and sanitary-can manufacture. Of the 18 workrooms, 9 were provided with no artificial ventilation, 4 were equipped with local exhaust ventilation, 2 with general room ventilation, 1 with both local exhaust and general ventilation, and 2 with what amounted practically to an inclosed process. In two instances (room 27A and room 75B) but one determination was made in each workroom in summer. The other summer averages are generally based on two or three determinations. Summer records in room 75A and in plants 83 and 150, as well as all the winter records, are based on the average of 10 to 20 determinations.

It has been pointed out above that the absorption method used in this investigation for the determination of benzol fails to distinguish between benzol and other solvent vapors, such as alcohol, methyl acetone, ethyl acetate, and the like. For the purpose of studying the efficiency of ventilation, however, the total concentration of solvent vapors is entirely satisfactory, and it is indicated in the table whether such other vapors were present in addition to benzol. The figures for solvent vapors are, however, all computed in terms of benzol.

TABLE 4.—*General summary of results*

Room No.	Process	Ventilation [1]	Gallons of benzol used per week	Concentration of solvent vapors (parts per million)						Solvent vapors other than benzol present	Blood findings	
				Summer			Winter				Number of persons examined	Number positive
				Average	Maximum	Minimum	Average	Maximum	Minimum			
28	Core painting	O	4,200	220	340	110					6	2
27A	Cement mixing	O	200	110	110	110				+	2	1
27B	Slickering	G	200	700	890	500				+	2	0
50A	Coating	L	2,500				500	1,020	180	+	4	1
50B	Mixing	E	2,500				430	450	410	+	3	1
59	Tire making	O	250	150	160	140	210	340	50		9	1
60	Cement mixing	O	60	150	190	100				+	1	0
61A	Insulating wire	O	300	130	210	50	210	460	40	+	12	6
61B	Compound mixing	O	300	1,360	2,640	80	580	880	220	+	1	1
75A	Coating	GL	4,200	130	410	30	330	480	130	+	10	1
75B	Compound mixing	E	4,200	100	100	100				+	3	1
78A	Lining	L	750	70	110	50	90	350	0		0	0
78B	Compound mixing	O	750	340	390	280					1	0
83	Cement mixing	O	10,000	620	860	310					9	6
91	Lining	L	450	180	300	20	400	500	280		5	0
95	Dry cleaning	G	500	1,800	4,140	230					3	2
150A	Coating	L	1,000	90	130	40					1	1
150B	Cementing	O	50	100	120	80					9	2

[1] O=none; G=general room ventilation; L=local exhaust ventilation; E=inclosed process. Examinations were made of as many workers as possible. Air samples represent conditions of the general room air and of the air at the station of the worker. All samples were taken at the breathing level.

It will be noted that a wide variation in concentration of solvent vapors was observed, ranging from 0 to 4,140 parts of benzol per million parts of air. In six instances comparable data for winter and summer conditions were secured. In rooms 59, 61A, 75A, 78A, and 91 the winter figures are from 25 to 100 per cent higher than those obtained in summer, as one might naturally expect from the effect of decreased ventilation. In the case of room 61B the summer figures are higher than the winter figures because a hot mixing process, which was going on when the summer samples were taken, had been abandoned in the winter.

A better idea of the significance of the results may be obtained by reference to Table 5, in which the average results of the air analyses are grouped according to the amount of solvent used and the character of the ventilation devices installed.

TABLE 5.—*Atmospheric concentration of solvent vapors in relation to amount of solvent used and ventilation procedures*

Group	Workroom	Gallons of benzol used per week	Ventilation	Average solvent vapors in air (p. p. m.)	
				Summer	Winter
I	150B	50	None	100	
	60	60	None	150	
	27A	200	None	110	
Small amount of benzol used; no local ventilation.	27B	200	General	700	
	59	250	None	150	210
	61A	300	None	130	210
	61B	300	None	1,360	580
II	91	450	Local	180	400
	78A	750	Local	70	90
	150A	1,000	Local	90	
Large amount of benzol used; local ventilation.	50A	2,500	Local		500
	50B	2,500	Inclosed		430
	75B	4,200	Inclosed	100	
	75A	4,200	General and local	130	330
III	95	500	General	1,800	
	78B	750	None	340	
Large amount of benzol used; no local ventilation.	23	4,200	None	220	
	83	10,000	None	620	

Group I includes seven workrooms, each using 300 gallons of benzol a week or less—one, 27B, provided with a system of general ventilation, the remainder with no artificial ventilation. In spite of the small amount of solvent used, the concentration of benzol vapors in the air was very high in the case of room 27B. Slickering of hides was the process carried out in this room, and the ventilation consisted only of general exhaust fans without hoods. This result (coupled with the data for room 95) confirms the opinion that this type of ventilation is distinctly unreliable. In the other six workrooms of this group there was no provision for artificial ventilation. In spite of this fact the benzol concentration in the air of five of the rooms (150B, 60, 27A, 59, and 61A) was fairly low in summer; but of those examined in winter (59 and 61A), both showed over 200 parts per million of solvent vapors. In rooms 60, 27A, and 61B the operation was a mixing process in which the extent of atmospheric contamination would naturally be less than in the case of cementing (150B), tire making (59), and insulating wire (61A). All that can be deduced from these figures is that, while the use of small amounts of benzol without ventilation may happen often to be associated with low benzol concentration in the air, such processes, even when confined to mixing, may at other times, particularly in winter, show marked atmospheric contamination.

Group II is of particular interest. Here are seven workrooms using from 450 to 4,200 gallons of benzol per week, all provided with systems of local ventilation (or, in the case of rooms 50B and 75B, with what were practically inclosed processes). Room 91 (in a sanitary-can plant) showed high benzol figures even in summer. This room had a good local exhaust from the ovens, but the temperature of the ovens was too low for the speed at which the can ends

passed through, so that the warm metal still gave off much benzol vapor after it emerged. These hot can ends were permitted to accumulate in large numbers in the room, and largely to this cause is attributed the high benzol concentration noted in the air. Room 75A was fairly low in benzol content in summer (130 parts per million), but high in winter (330 parts per million). This is a coating room with an exhaust ventilation system which our observer reported to be improperly arranged and in which the air was subject to additional pollution from the coated cloth which was allowed to cool in the room after passage through a hot chamber. Rooms 50A and 50B were examined only in winter and showed high benzol contents (500 and 430 parts per million). In room 50A, four machines for coating artificial-leather were provided with exhausts, while a fifth was not. In room 50B benzol was used in supposedly inclosed mixers, but maintenance was poor and much solvent was allowed to evaporate from open receptacles. Room 150A was a rubber coating room with local ventilation, but so operated as to threaten considerable atmospheric contamination; and room 75B was a mixing room in an artificial-leather factory. Both showed low benzol concentrations in summer but, unfortunately, they were not studied in winter. Finally, room 78A was a lining room in a sanitary-can factory with excellent local exhaust ventilation, in which summer analyses gave an average of 70 parts per million of benzol, and winter analyses (18 in number) an average of 90 parts per million. These last three plants, and particularly 78A, show what excellent results may occasionally be accomplished by local ventilation in the use of benzol.

Finally, group III consists of four plants using 500 to 10,000 gallons of benzol a week without local ventilation. Room 95, a dry-cleaning room, with general ventilation only, showed the highest average (1,800 parts per million) and the highest maximum (4,140 parts per million) benzol content revealed in the entire study. In all the other three cases the atmospheric contamination was also high, even though two of the rooms (78B and 83) were used only for mixing processes.

In general, it may be concluded from these studies of workroom air that rooms in which benzol is evaporated into the air without local exhaust ventilation will, in most cases, show high concentration of the fumes in the air of the rooms. Where the amount of benzol used was small, this was sometimes not apparent in our analyses (rooms 150B, 60, and 27A); but in room 60 only two analyses were made and in 27A only one analysis was made. Mixing processes were carried on in both rooms.

With ideal local exhaust ventilation, on the other hand, even large quantities of benzol can be used without heavy atmospheric contamination (78A, lining; 150A, coating; and 75B, mixing).

VII. RESULTS OF MEDICAL EXAMINATION AND CLINICAL TESTS MADE TO DISCOVER EARLY SIGNS OF BENZOL POISONING IN EXPOSED WORKERS

The examination of workers exposed to various concentrations of benzol in the atmosphere with a view to the determination of the extent of the existing hazard, is the crucial part of the investigation.

It is obvious that the symptoms of chronic benzol poisoning are such as to be frequently overlooked in the absence of careful and systematic medical examinations and the 98 cases of poisoning reported by the industries studied must greatly understate the case. Fortunately we have in the blood picture an excellent test for the detection of poisoning in its very early stages, and chief stress has been laid upon this point in our studies. Altogether it was found possible to make blood tests on 81 different individuals exposed to the influence of benzol in the 18 workrooms studied.

Wherever possible, general physical examinations were also made and medical histories obtained of the workers in question; but in many instances this could not be done. For recording the data obtained in the history and physical examination, the form reproduced below was used. It will be observed that certain plant and occupational data are first called for, followed by a list of the symptoms most commonly found to be of significance in the patient's history. The reverse side of the card was used for the findings of the medical examiner, laboratory notes, and personal and family data. This card was found to be very well suited to the purpose in hand.

Name---------- Plant----------	No----------
Industry----------	Occupation----------
Duration in industry----------	Previous occupation----------
Substances used----------	----------
Chief complaint----------	----------
Onset:	
Anorexia----------	Pallor----------
Nausea----------	Cyanosis----------
Vomiting----------	Dyspnea----------
Distress (p. c.)----------	Hemorrhages (note place)----------
Burning----------	----------
Pain----------	Menstrual disturbances----------
Constipation----------	Nose and throat----------
Diarrhea----------	Eye----------
Lose weight----------	Numbness----------
Headache----------	Tingling extremities----------
Dizziness----------	Paronychia----------
Fainting----------	Chills----------
Muscle weakness----------	Fever----------
Paresthesis----------	Chilly sensations----------
Paralysis----------	Skin eruptions----------
Changes of disposition----------	Frequency of urination----------
Irritability----------	Nocturia----------
Forgetfulness----------	Bloody urine----------
Lack of concentration----------	Infections----------
Remarks----------	

[Reverse side of card]

Findings:
- Pallor
- Nose and throat
- Eye
- Respiratory
- G.-I.
- Neuro-muscular
- G.-U.
- Skin condition
- Petechiæ
- Hemorrhage

Laboratory notes:
- Hgb ____ White count ____ Red count ____
- Differential ____ Poly ____ Lymph ____ L Mono ____ E ____ B ____
- Urine
- Blood pressure

Type of individual:
- Ruddy ____ Pale ____
- Fair ____ Dark ____
- Well nourished ____ Not ____

Family history of blood diseases, i. e.:
- Hemophilia ____ Anemia ____ Purpura ____
- Alcohol
- Previous illnesses
- Lues
- Martial

Impression:

As pointed out in the foregoing pages of this report, the change in the white blood cell count is by far the most important early sign of benzol poisoning. Normally, in health, the white blood cell count varies between 7,500 and 9,000 per cubic millimeter. As a lower limit in health, the figure 7,500 may be taken. In chronic benzol poisoning the count is reduced often much below this point and may reach an exceedingly low figure. In one case in the present investigation, in which the man remained at work, and his count was obtained while the usual routine study was being made, the white blood cell count was depressed to below 2,000. In attempting to fix on some definite standard for the white cell count which would, along with a history of exposure, be indicative of benzol poisoning, we decided that a fall of 25 per cent below the lower limit of the normal count of 7,500 (i. e., to 5,625) might be accepted as reasonably clear evidence of the condition in question. The interpretation of the blood picture was, however, not based solely on the total white cell count. Chronic benzol poisoning produces also a marked change in the relationship between the various types of white blood cells present. Ordinarily the polymorphonuclear white cells comprise between 65 and 70 per cent of all of the white blood cells, whereas the lymphocytes comprise but 20 to 30 per cent. In benzol poisoning the percentage of lymphocytes is relatively increased and that of the

polymorphonuclear leucocytes is markedly decreased. In making a diagnosis of benzol poisoning these aspects of the differential count were carefully considered.

This study had for its primary aim the correlation of the quantity of benzol vapor in the air with the clinical findings produced by the inhalation of this quantity of benzol. That such a correlation as this is not easily obtained was proved early in the course of the study. The quantity of benzol used in any plant may vary between very wide limits at different seasons of the year, and, moreover, in any given establishment the winter and summer concentrations of benzol may be, and, in most cases, are, widely different. An attempt was made, however, to overcome this condition by sampling the room air both in the winter and summer season wherever this was possible. The duration of exposure, too, has its obvious bearing on the problem; and in this connection it is advisable to reiterate that a marked variation in personal susceptibility to benzol poisoning exists. It was found, for example, that of many persons employed for equal periods of time in a plant using benzol, only a few will be found clearly positive; while in other plants the persons who are positive for benzol poisoning may have worked in the industry for a shorter period of time than those who are negative.

In the summer of 1924 blood tests were made on 84 different workers, but 56 of these operatives while in plants using benzol were not exposed to a degree which would lead one to expect anything but the negative results actually obtained. These 56 tests have, therefore, been excluded from further consideration, leaving 28 tests made on exposed workers during this period. In the winter of 1924–25, 53 more such tests were made, giving a total of 81 in all.

In Table 6 is presented a summary of these findings for the 18 workrooms studied, arranged in groups according to the amount of benzol used, the ventilation equipment, and the analytical results obtained.

TABLE 6.—*Summary of blood findings on examination of workers potentially exposed to benzol*

Group	Room	Local ventilation	Average benzol in air, parts per million		Blood findings	
			Summer	Winter	Number of persons examined	Number positive
I-A						
Small amount of benzol; no local ventilation; low benzol content in air.	150B	—	100	----------	9	2
	60	—	150	----------	1	0
	27A	—	110	----------	2	1
I-B						
Small amount of benzol; no local ventilation; high benzol content in air.	27B	—	700	----------	2	0
	59	—	150	210	9	1
	61A	—	130	210	12	6
	61B	—	1,360	580	1	1

TABLE 6.—*Summary of blood findings on examination of workers potentially exposed to benzol*—Continued

Group	Room	Local ventilation	Average benzol in air, parts per million		Blood findings	
			Summer	Winter	Number of persons examined	Number positive
II-A						
Large amount of benzol; local ventilation; low benzol content in air.	78A	+	70	90	0	----------
	150A	+	90	----------	1	1
	75B	+	100	----------	3	1
II-B						
Large amount of benzol; local ventilation; high benzol content in air.	91	+	180	400	5	*0
	50B	+	----------	430	3	1
	50A	+	----------	500	4	1
	75A	+	130	330	10	1
III						
Large amount of benzol; no local ventilation; high benzol content in air.	78B	−	340	----------	1	0
	23	−	----------	----------	6	2
	83	−	620	----------	9	6
	95	−	1,800	----------	3	2
Total	----------	----------	----------	----------	81	26

* 3 clinical cases, 1 fatal, since tests were made.

In making a presumptive diagnosis on the basis of the blood examinations only those cases were considered positive which showed less than 5,500 white cells per cubic millimeter (as compared with a normal count of 7,500 to 9,000), except in a single instance (room 150B), where a female cement worker with a border-line white-cell count of 5,800 was considered positive because of an exceedingly low red-cell count (2,800,000 red cells per cubic millimeter; hemoglobin 49 per cent of normal). Many other individuals examined showed white-cell counts between 5,500 and 6,000, which would ordinarily be considered as suspicious, but were omitted and only the clearly outstanding cases were considered positive.

From Table 7 it will be seen that 10 out of the 26 cases considered positive had a white-cell count below 4,000. The red-cell count we find less strikingly reduced than the white-cell count, only 10 of the cases being below 4,000,000. This is, of course, to be expected, since the red-cell count is usually affected considerably later than the white-cell count in the development of chronic benzol poisoning. In the early stages of this disease an abnormal stimulation of red-cell production may, indeed, sometimes be noted.

More detailed data in regard to the blood picture of 13 of the cases considered as characteristic of early benzol poisoning are presented in Table 8, which indicates the constant reduction of total white cells, the relatively increased proportion of lymphocytes, the reduction in hemoglobin, and the common, but not universal, reduction in red cell count.

Figures for normal male and female blood counts are cited for comparison.

TABLE 7.—*Distribution of blood counts in 25 individuals considered as presumptive cases of benzol poisoning*

	Number of cases		Number of cases
White cell counts:		Red cell counts:	
Under 2,000	1	Under 1,000,000	1
2,000 to 3,000	2	1,000,000 to 2,000,000	3
3,000 to 4,000	7	2,000,000 to 3,000,000	1
4,000 to 5,000	7	3,000,000 to 4,000,000	5
5,000 to 6,000	9	4,000,000 to 5,000,000	10
		5,000,000 to 6,000,000	6

TABLE 8.—*Detailed blood counts on 13 workers exhibiting the picture of early benzol poisoning*

Plant code No.	Hb.	R. B. C.	W. B. C.	Poly.	Lymphocytes	Large mononuclears	Eosin.	Trans.
				Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*
23	65	4,376,000	5,300	58	36	3.5	1.5	0.5
23	75	4,400,000	5,200	55	39	3.5	2.0	0.5
23			4,100					
23			4,800					
27	55	4,304,000	4,667	55	36	5.0	1.0	2.0
59	70	5,424,000	6,140	47	47	3.5	0.5	1.0
61	85		4,450					
61	50		4,000					
	40	1,736,000	3,600					
61	75		2,850					
	80	1,736,000	4,200					
61	23	800,000	3,000					
83	27	1,055,000	1,450	58	36	5.0	1.0	0.0
	41							
	30	2,100,000	2,100					
	29	1,365,000	2,200	44	49	6.0	1.0	0.0
95	55	3,193,000	3,100	50	39	1.5	7.0	1.5
95	70	4,968,000	3,600	47	41	0.5	8.0	3.0
Normal male	90–110	5,000,000 / 5,500,000	7,500	65–70	30	1–2	1–2	2–4
Normal female	50–100	4,500,000 / 5,000,000	7,500	65–70	30	1–2	1–2	2–4

It may be of some interest to present in some detail one or two cases of benzol poisoning which have come to our attention during the course of this study.

Case S. C.: A tire builder in a rubber-tire factory. Entered hospital May 20, 1924, with a complaint of weakness, dizziness, slight cough with shortness of breath, and palpitation. During three weeks prior to hospital entry, patient developed bleeding gums and severe nosebleeding. "Loss of ambition" and "sleepiness" were also stressed by the patient. Physical examination revealed pallor, pale gums with gingivitis, and fading brownish purpuric spots on thighs; the essential findings on study of this case were as follows:

Blood studies showed Hb., 30 per cent; R. B. C., 1,200,000; color index, 1.2; W. B. C., 1,800; platelets, 45,000.

Blood smear: Size and shape of red cells markedly uniform and regular for such a severe anemia. A few fragmented cells and a rare poikilocyte is seen. Slight polychromatophilia.

Gastric analysis, test meal: Total acidity, 56 per cent; free HCl, 26. A diagnosis of aplastic anemia, due to chronic benzol poisoning, was made.

Patient remained in hospital for five weeks. Had slight bleeding from gums after admission. Received two blood transfusions with marked symptomatic improvement. Discharged June 25, 1924; condition improved; to return for later transfusion. Blood count at discharge showed R. B. C. 2,280,000; Hb. 45 per cent; W. B. C., 1,800.

Case J. C.: A worker in a wire-insulating establishment; entered the hospital on May 18, 1924, complaining of progressive weakness for the past three months, with severe nosebleed, gastric disturbances, dyspnea, palpitation. Increasing pallor and yellowness of skin were observed by the patient. Neurological symptoms were lacking. A similar although milder attack was suffered by the patient about four years earlier while he was employed in the same factory.

Physical examination revealed only the presence of a distinct lemon yellow colored skin and hyperactive reflexes. The blood examination disclosed a negative Wassermann reaction. A diagnosis of chronic aplastic anemia, due to chronic benzol poisoning, was made. The chronological history of this patient's blood follows:

Date	R. B. C.	Hb.	W. B. C.	Polys.	Lymph.	Remarks
		Per cent				
Mar. 21, 1924	680,000	25	1,100	40	55	
Mar. 22, 1924	1,120,000	25				1½ hours post transfusion.
Apr. 3, 1924	1,296,000	35	1,150			
Apr. 5, 1924	1,520,000	40	1,350			20 hours post transfusion.
May 2, 1924	1,600,000	30	1,600	32	60	
May 7, 1924	1,760,000	40	1,400	60	39	Post transfusion.
May 17, 1924	2,112,000	40	1,800	47	49	

The patient was discharged after spending 57 days in the hospital and was ordered to remain away from the benzol atmosphere and to return to the clinic from time to time for examination.

It was found possible to obtain detailed clinical histories for only 9 out of the 26 individuals showing a blood picture characteristic of early benzol poisoning. The results are presented in Table 9.

TABLE 9.—*Symptomatology and physical findings on nine cases of early benzol poisoning*

Findings	Case									Total
	1	2	3	4	5	6	7	8	9	
Loss of appetite								+	+	2
Gastric disturbance								+		1
Constipation	+									1
Headache				+					+	2
Dizziness	+			+	+				+	4
Nosebleed								+		1
Pallor	+	+			+	+	+		+	6
Spongy gums					+				+	2
Poor nutrition					+					1

Pallor and dizziness were the most common symptoms, and five of the nine cases showed groups of symptoms which, on a careful medical inquiry, might have aroused suspicion of poisoning (case 1—constipation, dizziness, pallor; case 4—headache, dizziness; case 5—dizziness, pallor, spongy gums, poor nutrition; case 8—loss of appetite, gastric disturbance, nosebleed; case 9—loss of appetite, headache, dizziness, pallor, spongy gums). In general, however, the chief result of the examination of this small group of cases is to indicate that benzol poisoning may proceed for a considerable length of time and may produce marked changes in the blood-cell count of the patient without leading to any symptoms obvious enough to indicate to the patient that anything is wrong. Yet the relation discussed in a preceding section between low blood counts and susceptibility to microbic infection clearly indicates how serious such a condition may be.

Considering, then, the most important index of early benzol poisoning—reduction in the white-cell count—the results obtained (as indicated in Table 6) are distinctly disconcerting. In Group IA, which includes plants using small amounts of benzol and showing reasonably low concentrations of benzol in the air in summer, although lacking any provision for local exhaust ventilation, 3 out of 12 men examined showed the blood picture of chronic benzol poisoning. In Group IB, which includes rooms with small amounts of benzol in use, but without local exhaust ventilation, and showing high benzol concentration in the air, 8 out of 24 men examined gave positive results.

In Group IIB, with large amounts of benzol in use, and with local ventilation systems proved inefficient by high analytical results, 3 men out of 22 gave a blood picture characteristic of benzol poisoning; while in Group III, where large amounts of benzol were used without exhaust ventilation and with high contamination of the air, 10 out of 19 workers gave positive results.

There remains for special consideration Group IIA, which should furnish the crucial test of the benzol hazard under the most favorable possible conditions. Here large amounts of benzol were used, but with local exhaust systems so efficient that our records show averages of 105 parts per million or less. It is most unfortunate that we were unable, after repeated efforts, to secure permission to make blood examinations in room 78A (a sanitary can factory). In room 150A (a coating room) there was only one worker exposed to the fumes. He was positive, with a white count which fell progressively from 9,300 in October, 1924, to 5,500 in May, 1925, and to 4,700 in July, 1925. His red count remained over 4,000.000. In room 75B three men were exposed to benzol fumes (only 105 parts per million

of benzol in the air, as a result of excellent exhaust ventilation); but one of the three proved positive, with a white-cell count of 4,250 and a red count of 4,260,000. Even with exhaust ventilation of a good type giving average atmospheric benzol concentrations of less than 100 parts per million, the hazard from the use of benzol is evidently not entirely removed. Furthermore, our studies indicate that such excellent systems of ventilation are rare. Under the conditions in which benzol is actually used in industry to-day we have found that out of a total of 81 exposed workers examined, 26 showed a blood picture so characteristic as strongly to suggest benzol poisoning. We are forced to conclude that the use of benzol (except in inclosed mechanical systems), even when the workers are protected by the most complete and effective systems of exhaust ventilation, keeping the average concentration of benzol in the workroom air below 100 parts per million, involves a substantial hazard. Every possible effort should, therefore, be made to develop the use of substitute solvents of a less toxic nature wherever this is possible.

CONCLUSIONS IN REGARD TO THE USE OF BENZOL IN INCLOSED SYSTEMS

As pointed out above, benzol is used in industry under two more or less distinct sets of conditions. In the manufacture of benzol from coal and coal tar, in the blending of motor fuels, and in the chemical industries the solvent is necessarily handled in closed containers and pipe systems. Here chronic poisoning is unlikely to occur and the chief hazard arises from acute poisoning due to carelessness in the cleaning of tanks, breaks in the apparatus, and similar accidents.

With regard to this type of process it seems certain that with proper care in construction, maintenance, and operation, the use of benzol can be made sufficiently safe to warrant its employment. It is true that fatal accidents have occurred, and will no doubt continue to occur, in such processes, just as such accidents occur, and will continue to occur, from the use of steam boilers. The danger is, however, in both instances a controllable one, to be met by careful attention to safety provisions and not by the abandonment of the use of the substance or device in question.

The chief measures of protection which should be enforced in industries of this type are—

(*a*) Regular and systematic inspection of apparatus to insure against breaks or accidental leakage.

(*b*) The greatest possible care in freeing tanks or other receptacles which have contained benzol from all traces of the substance before they are entered for cleansing or repairing.

(c) The protection of workers entering inclosed spaces likely to contain benzol fumes by the use of positive pressure air helmets or hose masks; and the conduct of all such work by teams of two or more men who are familiar with the dangers involved.

CONCLUSIONS IN REGARD TO THE USE OF BENZOL AS A SOLVENT

In the rubber industry, in artificial-leather manufacture, in sanitary-can manufacture, in dry cleaning, and in the use of paints and varnishes benzol is employed as a solvent or vehicle under conditions which, almost of necessity, permit more or less evaporation of the solvent into the atmosphere. Here there is relatively little danger of acute benzol poisoning but very great danger of chronic poisoning, arising from prolonged or repeated exposure to the fumes.

In order to minimize such hazards as far as possible, there are two general types of precautions which should be taken, tending, (1) to decrease the degree of exposure and (2) to detect and control incipient poisoning in its earliest possible stages.

(1) To diminish exposure, inclosed processes should, of course, be used wherever possible, and whenever containers are cleaned or apparatus repaired the special precautions discussed in the preceding paragraph dealing with acute poisoning should be observed. Wherever employees are likely in the course of their work to be exposed to benzol fumes, as in the ordinary solvent and evaporative processes or in handling the products of such processes, they should be protected by the most effective local exhaust ventilation designed according to the following general principles:

(a) Where benzol is evaporated at room temperatures air removal by local exhaust ventilation with down draft is recommended, although in certain inclosed processes direct ventilation (from the inclosure) with upward draft may be indicated.

(b) Where localized heat is applied in the evaporation of the benzol, hoods or inclosures should be provided with up-draft local exhaust. This draft should be sufficiently intensive and applied so closely to the point of origin of the evaporating benzol as to insure the complete removal of all of the benzol before the heated surface is removed from the hood or inclosure. This recommendation deals with specific processes where sufficient upward air movement is created by the heated surface to overcome the natural density of the benzol vapor.

Masks and respirators should not be relied upon to protect the worker against ordinary routine exposure to benzol fumes, since such devices can not be made efficient without at the same time making them too uncomfortable to be worn continuously.

(2) To detect incipient benzol poisoning at a stage when its effects can be minimized, it seems essential to the committee that all work-

ers to be employed in processes where exposure to the fumes of this solvent is involved, should be given a thorough medical examination before employment, and reexamined, with systematic blood counts, once a month thereafter. In addition to this routine reexamination absence from work should be promptly followed up by some person conversant with the symptoms of benzol poisoning; and the employees themselves should be made familiar with the symptoms which are most likely to occur.

No worker should be employed in a benzol process who shows signs of—

(*a*) Organic disease of heart, lungs, or kidneys.
(*b*) Hemorrhagic tendencies.
(*c*) Anemia or any unusual blood picture.

Any worker who, on reexamination, shows any of the following symptoms should be promptly excluded from benzol exposure and transferred to some other department of the industry:

(*a*) Hemorrhages from the mucous membranes of the nose, mouth, or other organs.
(*b*) Decrease of more than the following from the employee's normal blood picture (normal conditions to be obtained from previous examinations of the individual employee)—
(1) White cells: Decrease of 25 per cent; but in no case should an employee with a white cell count of less than 5,000 be continued in benzol processes.
(2) Red cells: Decrease of 25 per cent.
(3) Hemoglobin: Below 70 per cent.

(NOTE.—Reduction in white cells is the most important condition to be noted.)

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PUBLIC HEALTH ENGINEERING ABSTRACTS

Recent studies relating to the purification of water and the action of various waters on lead and copper pipes.—John C. Thresh and John F. Beale. *Surveyor*, vol. 68, No. 1771, December 25, 1925, pp. 579–580. (Abstract by Rudolph E. Thompson.)

Excess lime treatment.—Data derived from the operation of a 25,000-gallon experimental plant in connection with the proposed supply of Southend Water Co., from the Rivers Chelmer and Blackwater are given. The purification process consisted of excess lime treatment, recarbonation, and rapid sand filtration. Sufficient lime was added to maintain an excess of 10 p. p. m. after 24 hours, the process being controlled by the reaction of the treated water to brilliant cresyl blue. With this excess the total number of bacteria was reduced from thousands to units, *B. coli* was invariably absent in 100 c. c. quantities, color of treated water was less than 10 American Public Health Association units, and organic matter was reduced 50 per cent. Lime in the form of lime water was found to be more efficient and economical than milk of lime. The addition, prior to adding the lime, of 1 gr. of aluminum sulphate per gallon was found necessary for rapid precipitation and color removal.

B. coli as an index of fecal contamination.—Contamination by birds and fish does not adequately explain the abundance of *B. coli* in certain stored waters, compared with the complete disappearance of this organism in water stored under laboratory conditions. In a recent investigation *B. coli* was found to flourish in the presence of the weed *Enteromorpha intestinalis*, which is usually found in brackish water but which in this case was growing abundantly in reservoir and filter beds. Similar multiplication occurred in presence of *Oscillatoria nigra*. Decaying weeds have been found to give rise to an enormous increase in *B. aerogenes*. These results indicate that presence of *B. coli* is not always evidence of manurial pollution.

DEATH RATES IN A GROUP OF INSURED PERSONS

Rates for Principal Causes of Death for May, 1926

The accompanying table is taken from the Statistical Bulletin for June, 1926, published by the Metropolitan Life Insurance Co., and presents the mortality experience of the industrial insurance department of the company for May, 1926, as compared with April, 1926, and with May and year, 1925. The rates are based on a strength of approximately 17,000,000 insured persons in the industrial populations of the United States and Canada.

The Bulletin states:

The death rate * * * during May (9.1 per 1,000) was substantially the same as reported for that month in 1925. Pronounced increases over last year's May figures were registered in the mortality from measles, whooping cough, influenza, and pneumonia; but these increases were about compensated by lower rates for diphtheria, tuberculosis, diarrheal diseases, and accidents. The May death rate was the lowest recorded for any month of 1926, and the decline of 24.2 per cent as compared with April is rather in excess of the seasonal drop expected at this time of the year. The outstanding factors in the decline from the April figure were lower death rates for influenza and pneumonia, the mortality from these diseases declining 57.8 per cent and 43.2 per cent, respectively.

Although the measles rate dropped from 21.3 per 100,000 in April, to 16.6 in May, and the whooping cough figure from 15.4 to 11 the May rates are still inordinately high for these two maladies, which the average citizen is wont to regard as of minor importance when compared with diphtheria and scarlet fever. Present-day mortality statistics of these diseases of childhood present a striking contrast to those of a few years ago. In this connection comparison of the table with a similar table for May, 1920, discloses a diphtheria rate of 16.2 per 100,000, which was much higher than the figure then shown for measles, and two and one-half times as high as the whooping cough death rate then recorded, despite the fact that 1920 was a year of above-average mortality from both measles and whooping cough. In May, 1926, on the other hand, we find measles to be the leader among the diseases of childhood, causing approximately twice as many deaths as diphtheria. Whooping cough is now second in importance with a much higher death rate than diphtheria and is charged with three and one-half deaths to every one from scarlet fever. While it is true that 1926, to date, has been a year of above-average prevalence of measles and whooping cough, it bids fair to mark a new minimum death rate for what has always been the most dreaded of the diseases of childhood; that is, diphtheria.

Death rates (annual basis) for principal causes per 100,000 lives exposed, April and May, 1926, and May and year, 1925

Cause of death	Death rate per 100,000 lives exposed [1]			
	May, 1926	April, 1926	May, 1925	Year 1925 [2]
Total, all causes	913.8	1,199.4	901.1	906.9
Typhoid fever	1.8	2.5	2.0	4.6
Measles	16.6	21.3	5.1	3.3
Scarlet fever	3.4	5.1	4.7	3.5
Whooping cough	11.0	15.4	8.1	7.7
Diphtheria	8.6	9.0	10.6	10.6
Influenza	38.5	91.3	25.5	21.9
Tuberculosis (all forms)	98.8	114.9	104.5	98.0
Tuberculosis of respiratory system	86.4	99.5	89.3	85.8
Cancer	65.5	77.1	67.2	70.5
Diabetes mellitus	14.0	20.1	14.4	15.2
Cerebral hemorrhage	50.2	61.3	50.6	53.5
Organic diseases of heart	126.6	171.8	126.7	128.6
Pneumonia (all forms)	108.4	191.0	96.5	86.7
Other respiratory diseases	12.5	19.6	14.5	13.3
Diarrhea and enteritis	15.4	17.8	19.4	36.6
Bright's disease (chronic nephritis)	69.6	82.6	68.0	69.8
Puerperal state	15.2	17.9	15.7	16.5
Suicides	7.8	7.6	5.4	6.9
Homicides	5.9	7.6	6.9	7.2
Other external causes (excluding suicides and homicides)	53.6	53.1	56.7	64.2
Traumatism by automobiles	14.9	13.5	14.4	16.5
All other causes	190.6	212.6	198.8	190.5

[1] All figures include infants insured under 1 year of age.
[2] Based on provisional estimate of lives exposed to risk in 1925.

DEATHS DURING WEEK ENDED JULY 10, 1926

Summary of information received by telegraph from industrial insurance companies for week ended July 10, 1926, and corresponding week of 1925. (From the Weekly Health Index, July 14, 1926, issued by the Bureau of the Census, Department of Commerce)

	Week ended July 10, 1925	Corresponding week, 1925
Policies in force	64, 650, 237	60, 488, 896
Number of death claims	8, 898	9, 399
Death claims per 1,000 policies in force, annual rate	7. 2	8. 1

Deaths from all causes in certain large cities of the United States during the week ended July 10, 1926, infant mortality, annual death rate, and comparison with corresponding week of 1925. (From the Weekly Health Index, July 14, 1926, issued by the Bureau of the Census, Department of Commerce)

City	Week ended July 10, 1926		Annual death rate per 1,000 corresponding week, 1925	Deaths under 1 year		Infant mortality rate, week ended July 10, 1926 [2]
	Total deaths	Death rate [1]		Week ended July 10, 1926	Corresponding week, 1925	
Total (64 cities)	6, 333	11. 7	11. 8	702	770	[3] 56
Akron	31			6	2	64
Albany [4]	25	11. 0	18. 6	1	5	21
Atlanta	77			16	11	
White	35			8		
Colored	42	([5])		8		
Baltimore [4]	184	11. 9	12. 7	24	29	70
White	137			16		57
Colored	47	([5])		8		130
Birmingham	82	20. 3	15. 5	15	14	
White	43			10		
Colored	39	([5])		5		
Boston	183	12. 1	14. 0	19	21	54
Bridgeport	26			4	1	68
Buffalo	134	12. 8	15. 6	22	19	92
Cambridge	18	7. 7	10. 9	2	4	33
Camden	27	10. 7	13. 8	6	2	101
Canton	21	10. 0	16. 2	1	4	22
Chicago [4]	624	10. 7	10. 5	59	57	52
Cincinnati	147	18. 6	11. 8	19	12	118
Cleveland	177	9. 6	10. 5	21	23	54
Columbus	86	15. 7	12. 9	5	9	46
Dallas	77	20. 1	11. 3	10	9	
White	62			10		
Colored	15	([5])		0		
Dayton	39	11. 5	8. 4	2	3	31
Denver	53	9. 7	13. 7	7	5	
Des Moines	29	10. 4	12. 2	4	2	67
Detroit	274	11. 1	9. 5	47	43	76
Duluth	23	10. 6	10. 4	4	5	94
El Paso	36	17. 2	16. 4	6	7	
Erie	27			5	0	95
Fall River [4]	30	11. 9	9. 3	6	5	87
Flint	24	9. 1	8. 8	3	4	50
Fort Worth	28	9. 2	12. 0	3	5	
White	24			3		
Colored	4	([5])		0		
Grand Rapids	29	9. 7	14. 9	5	8	72
Houston	58			4	8	
White	41			2		
Colored	17	([5])		2		
Indianapolis	92	13. 1	14. 7	9	11	66
White	76			8		68
Colored	16			1		55
Jersey City	57	9. 3	9. 4	14	6	99
Kansas City, Kans	42	18. 7	16. 6	3	6	52
White	32			1		21
Colored	10	([5])		2		263
Kansas City, Mo	97	13. 5	14. 0	6	6	
Los Angeles	195			13	25	36
Louisville	110	18. 4	17. 1	13	13	112
White	80			8		80
Colored	30	([5])		5		314

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended July 10, 1926, infant mortality, annual death rate, and comparison with corresponding week of 1925. (From the Weekly Health Index, July 14, 1926, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended July 10, 1926		Annual death rate per 1,000 corresponding week, 1925	Deaths under 1 year		Infant mortality rate, week ended July 10, 1926 [2]
	Total deaths	Death rate [1]		Week ended July 10, 1926	Corresponding week, 1925	
Lowell	23			4	3	74
Lynn	15	7.5	12.1	3	2	75
Memphis	81	23.9	16.7	9	6	
White	39			3		
Colored	42	(5)		6		
Milwaukee	102	10.3	7.8	15	6	69
Minneapolis	94	11.3	10.1	8	6	45
Nashville [4]	73	27.8	19.5	7	5	
White	45			4		
Colored	28	(5)		3		
New Bedford	20			0	7	0
New Haven	45	12.9	11.4	7	2	96
New Orleans	120	14.9	19.7	9	24	
White	61			2		
Colored	59	(5)		7		
New York	1,151	10.1	10.7	134	163	54
Bronx Borough	145	8.4	9.1	14	16	46
Brooklyn Borough	361	8.4	9.0	42	56	43
Manhattan Borough	502	13.9	14.0	64	75	71
Queens Borough	101	6.9	8.0	8	12	36
Richmond Borough	42	15.3	17.0	6	4	105
Newark, N. J	82	9.3	13.0	4	17	19
Norfolk	37	11.1	11.1	5	5	93
White	19			2		59
Colored	18	(5)		3		149
Oakland	42	8.4	9.9	3	7	35
Oklahoma City	22			2	5	
Omaha	48	11.6	13.3	7	2	73
Paterson	25	9.1	9.9	3	0	52
Philadelphia	455	11.8	10.4	31	51	41
Pittsburgh	112	9.2	10.5	13	19	43
Portland, Oreg	57			2	4	20
Providence	48	9.1	12.3	7	3	58
Richmond	67	18.5	17.1	15	11	188
White	30			5		98
Colored	37	(5)		10		350
Rochester	64	10.4	11.2	7	4	56
St. Louis	216	13.6	15.2	17	23	
St. Paul	68	14.3	10.4	3	3	27
Salt Lake City [4]	38	14.9	10.8	4	5	55
San Antonio	56	14.2	17.4	14	18	
San Diego	34	16.1	15.2	2	2	42
Schenectady	8	4.5	9.0	2	2	58
Seattle	64			3	6	28
Somerville	16	8.3	9.5	1	1	26
Spokane	32	15.3	11.0	2	3	47
Springfield, Mass	37	13.3	11.4	5	4	72
Syracuse	37	10.5	15.5	4	1	51
Tacoma	20	9.8	8.0	1	1	23
Toledo	61	10.8	11.1	4	4	39
Trenton	34	13.2	17.4	2	6	33
Washington, D. C	136	13.4	12.3	10	12	57
White	83			3		25
Colored	53	(5)		7		128
Waterbury	9			1	3	21
Wilmington, Del	30	12.6	12.4	1	2	23
Worcester	41	11.1	11.8	2	5	23
Yonkers	22	9.9	8.7	1	3	22
Youngstown	38	12.0	10.1	4	5	51

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 62 cities.
[4] Deaths for week ended Friday, July 9, 1926.
[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta 31, Baltimore 15, Birmingham 39, Dallas 15, Fort Worth 14, Houston 25, Kansas City, Kans., 14, Louisville 17, Memphis 38, Nashville 30, New Orleans 26, Norfolk 38, Richmond 32, and Washington, D. C., 25.

PREVALENCE OF DISEASE

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

UNITED STATES

CURRENT WEEKLY STATE REPORTS

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

Reports for Week Ended July 17, 1926

ALABAMA

	Cases
Chicken pox	2
Diphtheria	5
Influenza	2
Lethargic encephalitis	1
Malaria	58
Measles	56
Mumps	7
Pellagra	18
Pneumonia	23
Scarlet fever	4
Smallpox	20
Tetanus	2
Tuberculosis	45
Typhoid fever	83
Whooping cough	47

ARIZONA

Chicken pox	2
Diphtheria	2
Measles	1
Scarlet fever	1
Tuberculosis	1
Typhoid fever	4

ARKANSAS

Cerebrospinal meningitis	1
Chicken pox	11
Diphtheria	2
Hookworm disease	1
Influenza	4
Malaria	51
Measles	12
Mumps	2
Paratyphoid fever	1
Pellagra	8
Scarlet fever	6
Smallpox	4
Tuberculosis	9
Typhoid fever	7
Whooping cough	12

CALIFORNIA

	Cases
Cerebrospinal meningitis:	
Fresno	1
Sacramento	1
San Bernardino County	1
San Joaquin County	1
Chicken pox	67
Diphtheria	91
Influenza	4
Lethargic encephalitis:	
San Francisco	1
Santa Ana	1
Measles	228
Mumps	66
Poliomyelitis:	
Monrovia	1
Sacramento	1
Scarlet fever	63
Smallpox:	
Oakland	11
Scattering	10
Tuberculosis	173
Typhoid fever	12
Whooping cough	63

COLORADO

Chicken pox	24
Diphtheria	17
Hookworm disease	1
Measles	24
Mumps	2
Pneumonia	2
Scarlet fever	10
Smallpox	1
Tuberculosis	38
Typhoid fever	7
Whooping cough	26

CONNECTICUT

Chicken pox	29
Diphtheria	11
German measles	4

CONNECTICUT—continued

	Cases
Measles	76
Mumps	2
Pneumonia (all forms)	16
Scarlet fever	18
Septic sore throat	1
Tetanus	2
Tuberculosis (all forms)	36
Typhoid fever	7
Whooping cough	35

DELAWARE

Chicken pox	1
Malaria	3
Measles	2
Scarlet fever	4
Tuberculosis	3
Whooping cough	3

FLORIDA

Chicken pox	7
Diphtheria	13
Malaria	6
Measles	12
Mumps	1
Pneumonia	1
Scarlet fever	6
Smallpox	13
Tuberculosis	12
Typhoid fever	18
Whooping cough	19

GEORGIA

Cerebrospinal meningitis	1
Chicken pox	15
Diphtheria	3
Dysentery	17
Hookworm disease	7
Influenza	8
Malaria	53
Measles	19
Mumps	5
Septic sore throat	4
Smallpox	2
Tuberculosis	29
Typhoid fever	101
Typhus fever	2
Whooping cough	29

IDAHO

Cerebrospinal meningitis	1
Chicken pox	3
Diphtheria	1
Measles	6
Mumps	2
Scarlet fever	6
Smallpox	6
Tuberculosis	1
Typhoid fever	2
Whooping cough	2

ILLINOIS

Cerebrospinal meningitis:	
Cook County	1
Kane County	1
Lake County	1

ILLINOIS—continued

	Cases
Chicken pox	172
Diphtheria	46
Influenza	136
Lethargic encephalitis:	
Cook County	2
Iroquois County	1
Measles	425
Mumps	39
Pneumonia	245
Poliomyelitis:	
Cook County	3
Douglas County	1
Jefferson County	1
Sangamon County	1
Scarlet fever	108
Smallpox	20
Tuberculosis	434
Typhoid fever	20
Whooping cough	190

INDIANA

Chicken pox	31
Diphtheria	19
Influenza	1
Measles	125
Pneumonia	1
Poliomyelitis	1
Scarlet fever	27
Smallpox	46
Tuberculosis	37
Typhoid fever	6
Whooping cough	71

IOWA

Chicken pox	3
Diphtheria	9
German measles	6
Measles	25
Scarlet fever	14
Smallpox	9
Tuberculosis	2
Whooping cough	7

KANSAS

Cerebrospinal meningitis:	
Chanute	1
Tampa	1
Chicken pox	9
Diphtheria	10
German measles	1
Influenza	3
Measles	47
Mumps	12
Pneumonia	8
Scarlet fever	32
Smallpox	3
Tuberculosis	104
Typhoid fever	9
Whooping cough	90

LOUISIANA

Diphtheria	3
Influenza	29
Lethargic encephalitis	1
Malaria	36
Paratyphoid fever	2

LOUISIANA—continued

	Cases
Pneumonia	45
Poliomyelitis	1
Scarlet fever	4
Smallpox	1
Tuberculosis	54
Typhoid fever	59
Whooping cough	15

MAINE

Chicken pox	7
Diphtheria	3
German measles	8
Measles	87
Mumps	3
Pneumonia	4
Scarlet fever	10
Tetanus	6
Tuberculosis	16
Typhoid fever	1
Whooping cough	12

MARYLAND [1]

Cerebrospinal meningitis	1
Chicken pox	17
Diphtheria	9
Dysentery	5
German measles	1
Influenza	3
Lethargic encephalitis	2
Measles	90
Mumps	30
Pneumonia (all forms)	30
Poliomyelitis	3
Scarlet fever	24
Tetanus	2
Tuberculosis	53
Typhoid fever	15
Whooping cough	116

MASSACHUSETTS

Chicken pox	77
Diphtheria	35
German measles	37
Lethargic encephalitis	2
Malaria	1
Measles	208
Mumps	73
Ophthalmia neonatorum	37
Pellagra	2
Pneumonia (lobar)	34
Poliomyelitis	5
Scarlet fever	110
Septic sore throat	1
Trichinosis	1
Tuberculosis (all forms)	159
Typhoid fever	11
Whooping cough	156

MICHIGAN

Diphtheria	68
Measles	361
Pneumonia	44
Scarlet fever	132
Smallpox	8
Tuberculosis	46
Typhoid fever	7
Whooping cough	129

MINNESOTA

	Cases
Chicken pox	24
Diphtheria	43
Influenza	2
Lethargic encephalitis	1
Measles	97
Pneumonia	3
Poliomyelitis	1
Scarlet fever	102
Tuberculosis	55
Typhoid fever	5
Whooping cough	29

MISSISSIPPI

Poliomyelitis	7
Scarlet fever	6
Smallpox	5
Typhoid fever	51

MISSOURI

(Exclusive of Kansas City)

Cerebrospinal meningitis	4
Chicken pox	4
Diphtheria	28
Malaria	3
Measles	46
Mumps	6
Scarlet fever	35
Smallpox	13
Tetanus	1
Trachoma	1
Tuberculosis	41
Typhoid fever	27
Whooping cough	71

MONTANA

Chicken pox	2
German measles	3
Measles	14
Mumps	3
Ophthalmia neonatorum	1
Rocky Mountain spotted fever—Thurlow	1
Scarlet fever	5
Smallpox	5
Tuberculosis	1
Typhoid fever	2
Whooping cough	6

NEBRASKA

Chicken pox	18
Diphtheria	1
Measles	14
Mumps	2
Pneumonia	4
Scarlet fever	16
Smallpox	16
Tuberculosis	3
Typhoid fever	1
Whooping cough	18

NEW JERSEY

Chicken pox	69
Diphtheria	53
Dysentery	1
Influenza	1
Measles	130
Pneumonia	31

[1] Week ended Friday.

NEW JERSEY—continued

	Cases
Poliomyelitis	1
Scarlet fever	73
Smallpox	2
Trachoma	1
Typhoid fever	16
Whooping cough	88

NEW MEXICO

Chicken pox	3
Diphtheria	1
Measles	2
Pellagra	4
Pneumonia	2
Rabies in animals	2
Scarlet fever	2
Tuberculosis	19
Typhoid fever	7
Whooping cough	15

NEW YORK

(Exclusive of Buffalo and New York City)

Chicken pox	137
Diphtheria	61
German measles	85
Lethargic encephalitis	2
Malaria	3
Measles	898
Mumps	58
Ophthalmia neonatorum	2
Pneumonia	77
Poliomyelitis	4
Scarlet fever	58
Septic sore throat	2
Smallpox	5
Tetanus	4
Typhoid fever	12
Whooping cough	297

NORTH CAROLINA

Cerebrospinal meningitis	1
Chicken pox	17
Diphtheria	16
German measles	21
Measles	123
Poliomyelitis	10
Scarlet fever	7
Septic sore throat	1
Smallpox	31
Typhoid fever	69
Whooping cough	244

OKLAHOMA

(Exclusive of Oklahoma City and Tulsa)

Cerebrospinal meningitis:	
Johnston	1
Muskogee	1
Chicken pox	5
Diphtheria	6
Influenza	26
Malaria	79
Measles	17
Mumps	5
Pellagra	56
Pneumonia	11

OKLAHOMA—continued

	Cases
Poliomyelitis—Kiowa	2
Scarlet fever	15
Smallpox	4
Typhoid fever	84
Whooping cough	94

OREGON

Chicken pox	16
Diphtheria	14
Influenza	8
Malaria	1
Measles	24
Mumps	15
Rocky Mountain spotted fever	1
Scarlet fever	21
Septic sore throat	3
Smallpox	17
Tuberculosis	12
Typhoid fever	5
Whooping cough	7

PENNSYLVANIA

Chicken pox	138
Diphtheria	136
German measles	13
Lethargic encephalitis—Philadelphia	1
Measles	887
Mumps	13
Pneumonia	4
Poliomyelitis—Johnsonburg	1
Scarlet fever:	
Philadelphia	39
Scattering	148
Tetanus	3
Tuberculosis	111
Typhoid fever	19
Whooping cough	315

RHODE ISLAND

Chicken pox	6
Diphtheria	4
Measles	22
Mumps	3
Pneumonia	1
Scarlet fever	3
Tuberculosis	10
Whooping cough	9

SOUTH DAKOTA

Cerebrospinal meningitis	1
Measles	47
Pneumonia	1
Scarlet fever	3
Smallpox	5
Typhoid fever	1
Whooping cough	2

TENNESSEE

Chicken pox	7
Diphtheria	1
Dysentery	2
Influenza	7
Lethargic encephalitis:	
Chattanooga	1
Crockett County	1

TENNESSEE—continued

	Cases
Malaria	66
Measles	51
Mumps	1
Pellagra	19
Pneumonia	6
Rabies	1
Scarlet fever	9
Smallpox	2
Tuberculosis	39
Typhoid fever	108
Whooping cough	46

TEXAS

Cerebrospinal meningitis	1
Chicken pox	12
Dengue	2
Diphtheria	9
Dysentery	6
Influenza	4
Measles	8
Mumps	7
Pellagra	3
Pneumonia	4
Poliomyelitis	4
Scarlet fever	6
Smallpox	14
Tuberculosis	18
Typhoid fever	30
Whooping cough	45

UTAH

Chicken pox	8
Diphtheria	5
Measles	4
Mumps	3
Pneumonia	2
Scarlet fever	1
Smallpox	4
Whooping cough	68

VERMONT

Chicken pox	16
Diphtheria	1
Measles	53
Mumps	1
Poliomyelitis	1
Scarlet fever	4
Typhoid fever	2
Whooping cough	19

WASHINGTON

Cerebrospinal meningitis:	
Lincoln County	1
Stevens County	1
Chicken pox	33

WASHINGTON—continued

	Cases
Diphtheria	24
German measles	10
Measles	53
Mumps	6
Poliomyelitis—Yakima	1
Scarlet fever	18
Smallpox	10
Tuberculosis	33
Typhoid fever	4
Whooping cough	36

WEST VIRGINIA

Cerebrospinal meningitis—Tucker County	1
Chicken pox	20
Diphtheria	7
Measles	81
Scarlet fever	10
Smallpox	3
Tuberculosis	35
Typhoid fever	16
Whooping cough	12

WISCONSIN

Milwaukee:	
Chicken pox	37
Diphtheria	13
Measles	134
Mumps	24
Pneumonia	7
Scarlet fever	3
Tuberculosis	20
Whooping cough	74
Scattering:	
Cerebrospinal meningitis	1
Chicken pox	70
Diphtheria	16
German measles	16
Influenza	14
Measles	652
Mumps	21
Pneumonia	9
Scarlet fever	44
Smallpox	5
Tuberculosis	25
Whooping cough	134

WYOMING

Chicken pox	3
Diphtheria	1
German measles	2
Influenza	1
Measles	5
Rocky Mountain spotted fever	1
Scarlet fever	5
Tuberculosis	1
Whooping cough	31

Reports for Week Ended July 10, 1926

DISTRICT OF COLUMBIA

	Cases
Chicken pox	8
Diphtheria	15
Influenza	3
Measles	34
Pellagra	1
Pneumonia	2
Scarlet fever	5
Tuberculosis	17
Whooping cough	27

NORTH DAKOTA

	Cases
Chicken pox	12
Diphtheria	4
German measles	7
Measles	24
Mumps	2
Pneumonia	2
Scarlet fever	21
Smallpox	10
Tuberculosis	3
Whooping cough	36

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Cerebrospinal meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March, 1926										
New Mexico	0	37	141	1	14	0	1	34	10	2
April, 1926										
New Mexico	1	19	8	1	86	1	0	32	7	2
May, 1926										
New Mexico	0	13	1	4	74	1	0	44	0	2
June, 1926										
Georgia	2	21	60	172	460	48	0	5	71	153
Iowa	1	40	1	-------	334	-------	3	116	96	-------
Massachusetts	9	276	25	2	2,724	2	5	927	0	35
North Dakota	0	20	2	-------	110	-------	0	146	13	0
Tennessee	2	23	82	102	935	117	3	51	62	80
Vermont	0	1	0	0	429	0	2	11	0	2
Wisconsin	6	125	59	0	5,465	0	2	312	2	10

Number of Cases of Certain Communicable Diseases Reported for the Month of May, 1926, by State Health Officers

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Alabama	193	56	1,767	190	51	186	521	46	251
Arizona	49	9	41	11	37	10	127	27	9
Arkansas	141	7	268	99	92	35	40	19	155
California	961	454	2,047	1,245	573	144	902	88	324
Colorado	290	71	342	26	133	7	132	3	268
Connecticut	236	84	2,293	45	348	0	156	12	216
Delaware	4	10	194	-------	37	0	[1]1	0	6
District of Columbia	89	71	1,604	-------	132	3	93	5	161
Florida [2]									
Georgia	162	60	581	211	36	138	167	52	155
Idaho	49	24	60	60	68	48	[1]12	8	54
Illinois	1,082	300	5,095	345	1,397	137	1,853	34	827
Indiana	157	46	3,126	5	484	257	189	14	411
Iowa [2]									
Kansas	364	37	2,527	146	214	77	159	10	604
Kentucky [3]									
Louisiana	22	37	17	34	81	78	230	54	54
Maine	76	9	1,403	135	95	0	46	13	176
Maryland	358	69	1,809	896	244	0	286	24	292
Massachusetts	484	205	3,187	627	956	0	736	30	1,104
Michigan	354	349	6,441	133	1,288	45	628	23	651
Minnesota	502	208	3,526	-------	1,313	52	354	9	264
Mississippi	816	40	1,693	1,232	31	77	413	109	2,077
Missouri	237	311	7,227	111	1,122	47	227	64	349
Montana	85	5	447	23	138	24	56	4	38
Nebraska [2]									
Nevada [4]									
New Hampshire [4]									
New Jersey	710	328	6,991	-------	828	0	486	21	342
New Mexico	74	13	74	50	44	0	103	2	125
New York	1,465	940	13,794	1,078	1,933	9	1,750	83	1,789
North Carolina	383	65	1,705	-------	87	190	-------	21	1,243
North Dakota	46	28	126	60	256	31	12	2	53
Ohio	691	313	8,824	222	1,363	201	769	39	1,660
Oklahoma [5]	143	35	599	49	173	114	141	58	231
Oregon	201	73	407	132	238	107	[1]65	16	182
Pennsylvania [2]									
Rhode Island	15	30	474	8	36	0	41	2	71
South Carolina	302	79	237	7	62	80	299	99	512
South Dakota	46	19	283	125	417	11	5	0	98
Tennessee	212	60	3,154	106	170	147	281	51	196

Footnotes at end of table.

Number of Cases of Certain Communicable Diseases Reported for the Month of May, 1926, by State Health Officers—Continued

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Texas [3]									
Utah [2]									
Vermont	84	3	219	58	31	0	[1] 18	0	118
Virginia	772	69	3,328		206	69	[1] 174	35	721
Washington	337	85	292	192	289	143	184	24	259
West Virginia	113	57	3,394		165	17	141	57	146
Wisconsin	583	126	5,021	508	459	15	109	14	551
Wyoming	88	6	26	16	120	6		0	43

[1] Pulmonary.
[2] Report not received at time of going to press.
[3] Reports received weekly.
[4] Reports received annually.
[5] Exclusive of Oklahoma City and Tulsa.

Case Rates per 1,000 Population (Annual Basis) for the Month of May, 1926

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Alabama	0.91	0.26	8.36	0.90	0.24	0.88	2.46	0.22	1.19
Arizona	1.37	.25	1.15	.31	1.03	.28	3.55	.75	.25
Arkansas	.89	.04	1.69	.62	.58	.22	.25	.12	.98
California	2.74	1.29	5.84	3.55	1.63	.41	2.57	.25	.92
Colorado	3.30	.81	3.90	.30	1.51	.08	1.50	.03	3.05
Connecticut	1.78	.63	17.32	.34	2.63	.00	1.18	.09	1.63
Delaware	.20	.50	9.64		1.84	.00	[1] .05	.00	.30
District of Columbia	2.06	1.64	37.11		3.05	.07	2.15	.12	3.73
Florida [2]									
Georgia	.62	.23	2.22	.80	.14	.53	.64	.20	.59
Idaho	1.15	.56	1.40	1.40	1.59	1.12	[1] .28	.19	1.26
Illinois	1.81	.50	8.51	.58	2.33	.23	3.09	.06	1.38
Indiana	.60	.18	11.94	.02	1.85	.98	.72	.05	1.57
Iowa [2]									
Kansas	2.35	.24	16.33	.94	1.38	.50	1.03	.06	3.90
Kentucky [3]									
Louisiana	.20	.23	.11	.21	.50	.49	1.43	.34	.34
Maine	1.14	.13	21.04	2.02	1.42	.00	.69	.19	2.64
Maryland	2.71	.52	13.72	6.79	1.85	.00	2.17	.18	2.21
Massachusetts	1.26	.58	8.98	1.77	2.69	.00	2.07	.08	3.11
Michigan	.98	.97	17.87	.37	3.57	.12	1.74	.06	1.81
Minnesota	2.28	.94	15.99		5.96	.24	1.61	.04	1.20
Mississippi	5.37	.26	11.13	8.10	.20	.51	2.72	.72	13.66
Missouri	.80	1.05	24.46	.38	3.80	.16	.77	.22	1.18
Montana	1.51	.09	7.92	.41	2.44	.43	.99	.07	.67
Nebraska [2]									
Nevada [4]									
New Hampshire [4]									
New Jersey	2.34	1.08	23.06		2.73	.00	1.60	.07	1.13
New Mexico	2.23	.40	2.28	1.54	1.35	.00	3.17	.06	3.85
New York	1.54	.99	14.46	1.13	2.03	.01	1.83	.09	1.87
North Carolina	1.61	.27	7.18		.37	.80		.09	5.24
North Dakota	.78	.48	2.14	1.02	4.35	.53	.20	.03	.90
Ohio	1.27	.57	16.17	.41	2.50	.37	1.41	.07	3.04
Oklahoma [5]	.74	.18	3.10	.25	.89	.59	.73	.30	1.19
Oregon	2.76	1.00	5.59	1.81	3.27	1.47	[1] .89	.22	2.50
Pennsylvania [2]									
Rhode Island	.27	.55	8.64	.15	.66	.00	.75	.04	1.29
South Carolina	1.98	.52	1.55	.05	.41	.52	1.96	.65	3.36
South Dakota	.81	.33	4.96	2.19	7.31	.19	.09	.00	1.72
Tennessee	1.02	.29	15.22	.51	.82	.71	1.36	.25	.95
Texas [3]									
Utah [2]									
Vermont	2.81	.10	7.32	1.94	1.04	.00	[1] .60	.00	3.94
Virginia	3.67	.33	15.83		.98	.33	[1] .83	.17	3.43
Washington	2.64	.67	2.29	1.51	2.27	1.12	1.44	.19	2.03
West Virginia	.82	.41	24.58		1.19	.12	1.62	.41	1.06
Wisconsin	2.42	.52	20.88	2.11	1.91	.06	.45	.06	2.29
Wyoming	4.57	.31	1.35	.83	6.23	.31		.00	2.23

[1] Pulmonary.
[2] Report not received at time of going to press.
[3] Reports received weekly.
[4] Reports received annually.
[5] Exclusive of Oklahoma City and Tulsa.

PLAGUE-ERADICATIVE MEASURES IN LOS ANGELES, CALIF.

The following items were taken from the reports of plague-eradicative measures from Los Angeles, Calif.:

June 21 to June 29, 1926:

Number of rats trapped	389
Number of rats found to be plague infected	0
Number of squirrels examined	1,371
Number of squirrels found to be plague infected	0
Number of mice trapped	191
Number of mice found to be plague infected	0

Date of discovery of last plague infected rodent, November 6, 1925.
Date of last human case, January 15, 1925.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

Diphtheria.—For the week ended July 3, 1926, 37 States reported 934 cases of diphtheria. For the week ended July 4, 1925, the same States reported 814 cases of this disease. Ninety-nine cities, situated in all parts of the country and having an aggregate population of more than 30,350,000, reported 711 cases of diphtheria for the week ended July 3, 1926. Last year, for the corresponding week, they reported 515 cases. The estimated expectancy for these cities was 716 cases. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Measles.—Thirty-four States reported 6,941 cases of measles for the week ended July 3, 1926, and 2,169 cases of this disease for the week ended July 4, 1925. Ninety-nine cities reported 2,483 cases of measles for the week this year and 1,259 cases last year.

Poliomyelitis.—The health officers of 38 States reported 27 cases of poliomyelitis for the week ended July 3, 1926. The same States reported 68 cases for the week ended July 4, 1925.

Scarlet fever.—Scarlet fever was reported for the week as follows: Thirty-seven States—this year, 1,802 cases; last year, 1,052 cases; 99 cities—this year, 985 cases; last year, 524 cases; estimated expectancy, 487 cases.

Smallpox.—For the week ended July 3, 1926, 38 States reported 424 cases of smallpox. Last year for the corresponding week they reported 331 cases. Ninety-nine cities reported smallpox for the week as follows: 1926, 63 cases; 1925, 78 cases; estimated expectancy, 71 cases. No deaths from smallpox were reported by these cities for the week this year.

Typhoid fever.—Four hundred and fifty-two cases of typhoid fever were reported for the week ended July 3, 1926, by 36 States. For the corresponding week of 1925 the same States reported 784 cases of this disease. Ninety-nine cities reported 94 cases of typhoid fever for the week this year and 193 cases for the corresponding week last year. The estimated expectancy for these cities was 119 cases.

Influenza and pneumonia.—Deaths from influenza and pneumonia were reported for the week by 94 cities, with a population of more than 29,650,000, as follows: 1926, 461 deaths; 1925, 332 deaths.

City reports for week ended July 3, 1926

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

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1917 is included. In obtaining the estimated expectancy the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	75,333	0	1	0	0	0	15	0	2
New Hampshire:									
Concord	22,546	0	0	0	0	0	2	0	3
Manchester	83,097	0	1	0	0	0	1	0	2
Vermont:									
Barre	10,008	0	0	0	0	0	0	0	0
Massachusetts:									
Boston	779,620	21	45	20	0	0	68	41	16
Fall River	128,993	0	3	2	0	0	1	0	5
Springfield	142,065	9	2	0	1	1	2	0	1
Worcester	190,757	2	3	1	0	0	3	0	1
Rhode Island:									
Pawtucket	69,760	0	1	0	0	0	0	0	1
Providence	267,918	0	7	2	0	0	20	0	2
Connecticut:									
Bridgeport	(1)	0	4	2	1	1	2	0	2
Hartford	160,197	9	4	0	0	0	2	1	4
New Haven	178,927	5	2	0	0	0	20	0	2
MIDDLE ATLANTIC									
New York:									
Buffalo	538,016	17	9	12	0	1	12	2	9
New York	5,873,356	161	213	200	16	5	167	0	107
Rochester	316,786	7	5	8	0	0	16	0	6
Sycrause	182,003	12	5	3	0	0	165	8	2
New Jersey:									
Camden	128,642	3	3	7	0	0	24	0	2
Newark	452,513	28	12	10	0	0	39	16	3
Trenton	132,020	1	3	2	0	0	16	1	1
Pennsylvania:									
Philadelphia	1,979,364	55	49	74	----	7	86	12	29
Pittsburgh	631,563	27	16	12	----	1	96	0	21
Reading	112,707	3	2	0	----	0	8	0	0
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	409,333	2	6	4	0	2	63	3	5
Cleveland	936,485	37	18	42	0	1	10	2	9
Columbus	279,836	0	2	2	0	0	26	0	2
Toledo	287,380	30	5	5	0	1	95	0	7
Indiana:									
Fort Wayne	97,846	1	2	0	0	0	34	0	2
Indianapolis	358,819	6	3	4	0	1	5	0	8
South Bend	80,091	0	1	2	0	0	32	0	0
Terre Haute	71,071	0	0	0	0	0	6	0	0
Illinois:									
Chicago	2,995,239	117	77	32	4	2	253	13	27
Peoria	81,564	1	1	0	0	0	7	1	2
Springfield	63,923	1	1	0	0	0	7	0	1

City reports for week ended July 3, 1926—Continued

Division, State, and city	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria: Cases, estimated expectancy	Diphtheria: Cases reported	Influenza: Cases reported	Influenza: Deaths reported	Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
EAST NORTH CENTRAL—continued									
Michigan:									
Detroit	1,245,824	38	35	68	0	1	23	3	22
Flint	130,316	1	2	2	0	0	68	1	2
Grand Rapids	153,698	4	2	0	0	0	51	1	0
Wisconsin:									
Kenosha	50,891	2	0	0	0	0	166	0	0
Madison	46,385	10	0	0	0	0	13	1	0
Milwaukee	509,192	48	10	15	0	0	170	4	8
Racine	67,707	7	1	0	0	0	170	0	2
Superior	39,671	0	0	1	0	0	0	0	2
WEST NORTH CENTRAL									
Minnesota:									
Duluth	110,502	1	1	2	0	0	36	0	1
Minneapolis	425,435	67	10	17	0	2	14	0	6
St. Paul	246,001	8	11	7	0	0	100	0	2
Iowa:									
Davenport	52,469	0	1	0	0	-------	0	0	-------
Sioux City	76,411	0	0	0	0	-------	1	0	-------
Waterloo	36,771	3	1	0	0	-------	26	0	-------
Missouri:									
Kansas City	367,481	1	4	2	2	2	4	2	6
St. Joseph	78,342	0	1	1	0	0	1	0	1
St. Louis	821,543	1	26	29	0	0	91	1	-------
North Dakota:									
Fargo	26,403	0	0	1	0	0	2	3	0
Grand Forks	14,811	-------	0	-------	-------	-------	-------	-------	-------
South Dakota:									
Aberdeen	15,036	0	0	0	0	-------	1	1	-------
Sioux Falls	30,127	-------	0	-------	-------	-------	-------	-------	-------
Nebraska									
Lincoln	60,941	3	1	0	0	0	2	1	0
Omaha	211,768	6	2	1	0	0	22	0	2
Kansas:									
Topeka	55,411	6	1	2	0	0	3	0	0
Wichita	88,367	0	1	0	0	0	0	0	0
SOUTH ATLANTIC									
Delaware:									
Wilmington	122,049	0	1	2	0	0	3	0	1
Maryland:									
Baltimore	796,296	28	12	12	6	1	10	27	14
Cumberland	33,741	0	0	0	0	0	1	0	2
Frederick	12,035	0	0	0	0	0	0	0	0
District of Columbia:									
Washington	497,906	13	5	23	1	1	32	0	11
Virginia:									
Lynchburg	30,395	1	0	1	0	0	14	0	0
Norfolk	(1)	4	0	0	0	0	8	0	4
Richmond	186,403	0	1	1	0	1	58	7	2
Roanoke	58,208	0	0	0	0	0	4	0	2
West Virginia:									
Charleston	49,019	0	0	0	0	1	9	0	0
Huntington	63,485	-------	-------	-------	-------	-------	-------	-------	-------
Wheeling	56,208	5	0	0	0	0	22	0	0
North Carolina:									
Raleigh	30,371	0	0	2	0	0	0	0	0
Wilmington	37,061	0	0	0	0	0	1	0	1
Winston-Salem	69,031	0	0	0	0	0	38	1	2
South Carolina:									
Charleston	73,125	0	0	0	7	0	1	0	1
Columbia	41,225	0	0	1	0	0	0	0	0
Greenville	27,311	1	0	0	0	0	0	0	0
Georgia:									
Atlanta	(1)	2	1	1	0	0	19	5	4
Brunswick	16,809	0	0	0	0	0	12	0	1
Savannah	93,134	0	1	1	0	0	0	0	0
Florida:									
Miami	69,754	0	-------	2	0	0	3	0	1
Tampa	94,743	0	0	0	0	0	0	0	2

[1] No estimate made.

City reports for week ended July 3, 1926—Continued

Division, State, and city	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,309		1						
Louisville	305,935	4	3	0	0	0	4	0	9
Tennessee:									
Memphis	174,533	0	1	2	0	0	38	0	6
Nashville	136,220	0	0	2	0	0	0	0	3
Alabama:									
Birmingham	205,670	5	1	0	0	0	35	1	3
Mobile	65,955	0	0	0	0	0	0	0	1
Montgomery	46,481	0	0	0	0	0	1	1	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	31,643	0	0	0	0		1	0	
Little Rock	74,216	0	0	0	0	0	9	1	2
Louisiana:									
New Orleans	414,493	0	5	4	2	2	0	0	2
Shreveport	57,857	0	0	0	0	0	1	0	3
Oklahoma:									
Oklahoma City	(1)	0	0	0	0	0	2	0	1
Texas:									
Dallas	194,450	3	2	4	0	1	0	1	4
Galveston	48,375	0	0	0	0	0	0	0	0
Houston	164,954	0	1	2	0	0	0	0	0
San Antonio	198,069	0	1	1	0	0	1	0	1
MOUNTAIN									
Montana:									
Billings	17,971		0	0	0	0	1		1
Great Falls	29,883	3	0	1	0	0	15	0	1
Helena	12,037	0	0	0	0	0	0	0	0
Missoula	12,668	0	0	0	0	0	0	1	0
Idaho:									
Boise	23,042	0	1	0	0	0	0	0	0
Colorado:									
Denver	280,911	15	9	4		1	18	0	1
Pueblo	43,787	3	1	8	0	0	12	0	1
New Mexico:									
Albuquerque	21,000	0	0	1	0	0	0	0	0
Arizona:									
Phoenix	38,669	0	0	0	0	0	0	0	1
Utah:									
Salt Lake City	130,948	4	3	4	0	0	2	3	1
Nevada:									
Reno	12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	(1)	17	5	1	0		25	10	
Spokane	108,897	10	2	2	0		53	0	
Tacoma	104,455	6	2	2	0	0	5	0	3
Oregon:									
Portland	282,383	13	4	9	1	0	50	2	1
California:									
Los Angeles	(1)	18	35	33	3	1	16	10	7
Sacramento	72,260	0	2	2	0	0	0	2	1
San Francisco	557,530	8	16	8	0	0	72	4	1

[1] No estimate made.

City reports for week ended July 3, 1926—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	1	1	0	0	0	1	1	2	0	3	22
New Hampshire:											
Concord	0	2	0	0	0	0	0	0	0	0	11
Manchester	0	0	0	0	0	0	0	0	0	0	18
Vermont:											
Barre	0	0	0	0	0	0	0	0	0	0	3
Massachusetts:											
Boston	25	57	0	0	0	10	3	1	0	52	186
Fall River	1	5	0	0	0	2	3	0	0	1	33
Springfield	3	1	0	0	0	4	0	1	0	1	40
Worcester	4	2	0	0	0	4	0	0	0	2	37
Rhode Island:											
Fawtucket	0	0	0	0	0	1	0	0	0	0	20
Providence	4	5	0	0	0	2	1	0	0	11	65
Connecticut:											
Bridgeport	4	3	0	0	0	0	0	0	0	1	21
Hartford	3	0	0	0	0	0	1	0	0	1	21
New Haven	1	3	0	0	0	2	0	1	0	2	42
MIDDLE ATLANTIC											
New York:											
Buffalo	13	10	0	0	0	8	0	0	0	19	130
New York	86	249	0	1	0	[1] 103	17	15	2	69	1,212
Rochester	7	5	0	0	0	5	0	0	0	5	56
Syracuse	5	1	0	0	0	3	1	0	0	23	43
New Jersey:											
Camden	1	4	0	0	0	1	0	0	0	3	30
Newark	11	22	0	3	0	9	1	1	0	15	94
Trenton	1	1	0	0	0	5	0	2	1	5	38
Pennsylvania:											
Philadelphia	39	66	0	0	0	30	5	4	0	44	443
Pittsburgh	13	15	0	0	0	8	2	1	0	85	164
Reading	1	5	0	0	0	0	1	0	0	6	28
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	5	9	1	1	0	8	1	1	0	7	120
Cleveland	11	44	2	1	0	13	2	3	0	70	165
Columbus	3	14	1	0	0	8	1	0	0	7	72
Toledo	9	7	1	0	0	8	1	0	0	45	64
Indiana:											
Fort Wayne	1	5	1	1	0	0	0	0	0	1	15
Indianapolis	3	4	3	9	0	10	1	0	0	29	77
South Bend	1	1	0	1	0	1	1	0	0	0	13
Terre Haute	1	0	1	0	0	0	0	0	0	1	16
Illinois:											
Chicago	50	79	2	2	0	46	3	1	0	49	621
Peoria	1	1	0	1	0	2	0	0	0	6	20
Springfield	1	3	0	0	0	0	0	0	0	8	11
Michigan:											
Detroit	39	87	5	0	0	22	3	2	0	71	285
Flint	2	7	1	0	0	1	1	0	0	3	21
Grand Rapids	3	7	0	0	0	0	1	0	0	6	35
Wisconsin:											
Kenosha	1	0	2	0	0	0	1	0	0	5	6
Madison	1	0	0	0	0	0	0	1	0	2	------
Milwaukee	17	12	3	0	0	6	1	0	0	43	91
Racine	2	0	1	0	0	1	0	0	0	7	11
Superior	1	2	2	0	0	2	0	0	0	0	11

City reports for week ended July 3, 1926—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST NORTH CENTRAL											
Minnesota:											
Duluth	2	20	3	0	0	0	0	0	0	2	10
Minneapolis	14	31	5	0	0	6	1	1	0	1	91
St. Paul	9	14	2	1	0	1	0	0	0	27	51
Iowa:											
Davenport	1	1	1	0			0	0		0	
Sioux City	1	3	2	6			0	0		0	0
Waterloo	1	0	1	0			0	0		7	
Missouri:											
Kansas City	2	3	3	0	0	1	1	1	0	6	76
St. Joseph	0	0	0	0	0	0	0	0	0	0	30
St. Louis	12	42	1	2	0	9	3	1	0	39	234
North Dakota:											
Fargo	0	3	0	0	0	1	0	0	0	0	5
Grand Forks	0		0				0				
South Dakota:											
Aberdeen	1	2	1	0			0	0		3	
Sioux Falls	0		0				0				
Nebraska:											
Lincoln	0	0	0	3	0	1	0	0	0	24	
Omaha	2	18	3	4	0	3	0	0	0	1	57
Kansas:											
Topeka	1	0	0	0	0	2	1	2	0	15	22
Wichita	1	0	3	0	0	4	1	0	0	5	35
SOUTH ATLANTIC											
Delaware:											
Wilmington	2	3	0	0	0	1	0	2	0	2	24
Maryland:											
Baltimore	11	14	0	0	0	18	4	3	2	53	199
Cumberland	1	0	0	0	0	1	0	0	0	0	13
Frederick	0	0	0	0	0	0	0	0	0	0	6
District of Col.:											
Washington	7	2	0	0	0	10	3	0	0	44	132
Virginia:											
Lynchburg	0	2	0	0	0	1	0	0	0	8	13
Norfolk	0	3	1	1	0	1	2	0	0	47	
Richmond	1	7	0	1	0	3	1	2	0	3	49
Roanoke	0	0	0	1	0	3	0	0	0	0	25
West Virginia:											
Charleston	1	1	0	0	0	2	1	0	0	6	19
Wheeling	1	0	0	0	0	0	1	0	0	0	14
North Carolina:											
Raleigh	0	0	0	0	0	1	0	0	0	8	8
Wilmington	0	0	0	0	0	0	0	0	0	9	11
Winston-Salem	0	1	1	0	0	1	2	1	0	0	23
South Carolina:											
Charleston	0	0	0	1	0	4	2	3	0	0	23
Columbia	0	0	0	0	0	0	1	0	0	1	
Greenville	0	0	0	0	0	1	1	2	0	3	12
Georgia:											
Atlanta	2	2	5	0	0	6	3	4	2	3	75
Brunswick	0	0	0	0	0	2	0	0	0	0	4
Savannah	0	0	0	2	0	0	2	1	0	0	28
Florida:											
Miami		0		0	0	2		1	1	5	24
St. Petersburg	0		0			0	0	0		0	0
Tampa	0	0	0	0	0	2	0	1	0	0	29
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1		0				0				
Louisville	2	6	0	0	0	9	2	4	0	3	98
Tennessee:											
Memphis	1	4	1	6	0	6	3	5	0	9	
Nashville	0	0	0	0	0	6	4	4	0	16	40
Alabama:											
Birmingham	1	1	1	0	0	3	3	4	0	28	54
Mobile	0	0	1	0	0	1	1	5	0	1	29
Montgomery	1	1	0	1	0	0	1	1	0	0	18

City reports for week ended July 3, 1926—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	0	0	0			1	0	0	17	
Little Rock	0	1	0	0	0	3	1	1	0	0	
Louisiana:											
New Orleans	2	4	1	0	0	20	5	0	0	12	136
Shreveport	0	2	0	0	0	2	2	0	0	0	23
Oklahoma:											
Oklahoma	0	0	2	0	0	2	1	2	0	0	25
Texas:											
Dallas	2	4	1	0	0	0	3	1	1	8	44
Galveston	1	0	0	3	0	2	1	0	0	0	17
Houston	1	2	0	2	0	0	2	0	0	0	37
San Antonio	1	1	1	0	0	5	1	1	1	0	54
MOUNTAIN											
Montana:											
Billings	0	4	1	0	0	0	0	0	0		4
Great Falls	2	0	1	0	0	1	0	0	0	0	11
Helena	0	0	0	0	0	0	0	0	0	0	3
Missoula	0	0	0	0	0	0	0	0	0	0	9
Idaho:											
Boise	0	0	0	3	0	0	0	0	0	0	6
Colorado:											
Denver	6	5	0	0	0	10	1	0	0	21	71
Pueblo	1	1	0	1	0	1	0	3	0	0	7
New Mexico:											
Albuquerque	0	1	0	0	0	6	0	0	0	2	16
Arizona:											
Phoenix	0	0	0	0	0	5	0	0	0	0	18
Utah:											
Salt Lake City	2	0	1	1	0	0	1	0	0	50	27
Nevada:											
Reno	0	0	1	1	0	0	0	0	0	0	1
PACIFIC											
Washington:											
Seattle	6	3	3	6			1	0		7	
Spokane	3	7	3	6			1	3		5	
Tacoma	1	5	2	7	0	0	0	0	0	1	19
Oregon:											
Portland	5	8	5	24	0	3	0	2	1	2	74
California:											
Los Angeles	12	30	2	0	0	33	3	2	0	13	232
Sacramento	1	1	0	0	0	2	1	3	0	0	26
San Francisco	9	10	1	0	0	11	1	0	0	2	155

Division, State, and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Maine:									
Portland	1	0	0	0	0	0	0	0	0
Massachusetts:									
Boston	2	1	1	1	0	0	1	0	0
Springfield	1	1	0	1	0	0	0	0	0
Rhode Island:									
Providence	0	0	1	0	0	0	0	0	0
Connecticut:									
New Haven	1	0	0	0	0	0	0	0	0

City reports for week ended July 3, 1926—Continued

Division, State, and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
MIDDLE ATLANTIC									
New York:									
New York City	7	2	12	1	0	1	3	1	1
Pennsylvania: [1]									
Philadelphia	0	0	0	0	0	0	0	0	10
EAST NORTH CENTRAL									
Ohio:									
Cleveland	0	0	0	0	0	0	0	1	0
Toledo	0	1	0	0	0	0	0	0	0
Illinois:									
Chicago	0	1	1	0	0	0	1	0	0
Michigan:									
Detroit	3	1	0	0	0	0	0	1	0
Flint	0	0	0	0	0	0	0	1	0
Wisconsin:									
Milwaukee	0	0	1	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	1	1	0	0	0	0	0	0	0
Missouri:									
St. Louis	1	1	0	0	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	0	0	0	0	1	0	1	0	0
District of Columbia:									
Washington	0	1	0	0	0	0	0	0	0
Virginia:									
Richmond	0	1	0	0	0	1	0	0	0
Roanoke	0	0	0	0	0	0	0	0	1
North Carolina:									
Raleigh	0	0	0	0	0	1	0	0	0
Wilmington	0	0	0	0	0	1	0	0	0
Winston-Salem	0	0	0	0	1	1	0	0	0
South Carolina:									
Charleston [2]	0	0	0	0	2	0	0	0	0
Greenville	0	1	0	0	0	0	0	0	0
Georgia:									
Atlanta	0	0	0	0	0	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	0	0	0	0	2	1	0	0	0
Alabama:									
Mobile	0	0	0	0	0	2	0	0	0
Montgomery	0	0	0	0	1	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	0	0	0	0	2	0	0	0
Louisiana:									
New Orleans	0	0	3	2	0	0	1	0	0
Texas:									
Dallas	0	0	0	0	0	0	0	3	3
Houston	0	0	0	0	1	1	0	1	0
San Antonio	0	0	0	0	0	1	0	1	2
PACIFIC									
Washington:									
Seattle	1	0	0	0	0	0	0	0	0
California:									
Los Angeles	1	0	0	0	0	0	1	1	0
Sacramento	0	0	0	0	0	0	0	1	1

[1] Rabies in man—1 death at Pittsburgh, Pa.
[2] Dengue—1 case, Charleston, S. C.

The following table gives the rates per 100,000 population for 103 cities for the five-week period ended July 3, 1926, compared with those for a like period ended July 4, 1925. The population figures used in computing the rates are approximate estimates as of July 1, 1925 and 1926, respectively, authoritative figures for many of the cities not being available. The 103 cities reporting cases had an estimated aggregate population of nearly 30,000,000 in 1925 and nearly 30,500,000 in 1926. The 96 cities reporting deaths had more than 29,250,000 estimated population in 1925 and more than 29,750,000 in 1926. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, May 31 to July 3, 1926—Annual rates per 100,000 population—Compared with rates for the corresponding period of 1925 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	June 6, 1925	June 5, 1926	June 13, 1925	June 12, 1926	June 20, 1925	June 19, 1926	June 27, 1925	June 26, 1926	July 4, 1925	July 3, 1926
103 cities	[2] 152	[3] 117	116	[3] 136	114	[3] 113	112	[3] 131	[4] 92	[5] 122
New England	125	78	91	69	93	78	122	59	113	64
Middle Atlantic	243	134	155	155	166	124	163	152	95	163
East North Central	92	119	89	146	86	131	78	161	81	117
West North Central	183	[3] 207	141	[3] 231	129	[3] 167	111	[3] 195	127	[6] 125
South Atlantic	[2] 88	47	54	60	48	68	69	45	38	83
East South Central	11	16	11	26	5	16	32	10	5	[7] 22
West South Central	40	56	66	47	70	43	44	43	57	47
Mountain	74	109	176	127	185	146	102	118	176	155
Pacific	138	132	157	159	108	102	102	132	[4] 138	129

MEASLES CASE RATES

103 cities	[2] 594	[3] 1,014	558	[3] 928	416	[3] 734	292	[3] 617	[4] 225	[5] 435
New England	841	728	860	659	611	494	393	425	338	319
Middle Atlantic	771	751	724	707	542	585	380	476	257	313
East North Central	825	1,103	779	1,018	547	943	377	828	300	634
West North Central	111	[3] 2,209	131	[3] 2,038	84	[3] 1,260	58	[3] 935	30	[6] 604
South Atlantic	[2] 393	1,213	280	1,103	330	825	263	701	248	436
East South Central	121	1,660	194	1,396	105	695	121	612	89	[7] 430
West South Central	22	86	13	125	18	77	4	95	4	52
Mountain	37	1,247	92	919	74	701	92	792	37	437
Pacific	157	696	83	593	80	582	50	485	[4] 35	461

SCARLET FEVER CASE RATES

103 cities	[2] 256	[3] 231	170	[3] 261	159	[3] 233	113	[3] 212	[4] 95	[5] 170
New England	256	248	173	255	137	203	103	236	108	187
Middle Atlantic	262	209	155	195	144	221	99	210	79	188
East North Central	293	247	198	333	202	340	146	253	114	187
West North Central	466	[3] 416	315	[3] 621	317	[3] 480	179	[3] 354	163	[6] 270
South Atlantic	[2] 125	190	58	160	58	131	42	152	56	66
East South Central	116	195	147	78	147	47	84	47	68	[7] 66
West South Central	84	163	44	86	35	69	53	30	44	60
Mountain	324	218	268	118	139	127	203	118	102	91
Pacific	144	170	155	237	110	216	102	159	[4] 67	151

[1] The figures given in this table are rates per 100,000 population, annual basis—and not the number of cases reported. Populations used are estimated as of July 1, 1925 and 1926, respectively.
[2] Wilmington, N. C., not included.
[3] Grand Forks, N. Dak., not included.
[4] Spokane, Wash., not included.
[5] Grand Forks, N. Dak., Sioux Falls, S. Dak., and Covington, Ky., not included.
[6] Grand Forks, N. Dak., and Sioux Falls, S. Dak., not included.
[7] Covington, Ky., not included.

Summary of weekly reports from cities, May 31 to July 3, 1926—Annual rates per 100,000 population—Compared with rates for the corresponding period of 1925—Continued

SMALLPOX CASE RATES

	Week ended—									
	June 6, 1925	June 5, 1926	June 13, 1925	June 12, 1926	June 20, 1925	June 19, 1926	June 27, 1925	June 26, 1926	July 4, 1925	July 3, 1926
103 cities	[2] 45	[3] 15	36	[3] 16	35	[3] 11	24	[3] 16	[4] 14	[5] 11
New England	0	0	0	0	0	0	0	0	0	0
Middle Atlantic	4	0	2	0	1	0	0	0	1	2
East North Central	61	9	40	12	42	10	19	14	13	10
West North Central	92	[3] 40	50	[3] 28	58	[3] 32	36	[3] 44	16	[6] 26
South Atlantic	[2] 37	34	21	38	29	30	13	26	10	11
East South Central	105	83	273	52	184	10	121	88	58	[7] 39
West South Central	31	43	4	34	18	26	0	17	4	22
Mountain	37	27	28	46	18	27	28	18	28	55
Pacific	182	24	141	54	146	24	163	32	[4] 85	19

TYPHOID FEVER CASE RATES

103 cities	[2] 24	[3] 9	27	[3] 12	21	[3] 11	25	[3] 12	[4] 35	[5] 17
New England	29	0	24	17	19	19	17	9	22	12
Middle Atlantic	26	9	17	6	14	9	18	10	15	11
East North Central	9	5	9	4	6	4	8	4	10	5
West North Central	8	[3] 8	24	[3] 6	12	[3] 10	10	[3] 4	20	[6] 10
South Atlantic	[2] 39	32	61	26	46	28	67	30	65	36
East South Central	37	10	110	57	74	21	84	36	184	[7] 127
West South Central	84	9	110	52	123	30	128	30	233	13
Mountain	74	9	46	9	37	0	0	0	9	27
Pacific	8	8	14	13	6	8	19	16	[4] 21	22

INFLUENZA DEATH RATES

96 cities	[2] 10	8	7	10	6	7	6	5	4	[8] 6
New England	2	2	5	12	2	9	7	0	2	5
Middle Atlantic	11	6	6	9	4	9	6	6	2	7
East North Central	10	8	6	10	7	3	6	3	5	5
West North Central	4	8	8	4	6	4	4	6	0	[9] 8
South Atlantic	[2] 6	8	4	6	6	4	2	6	6	8
East South Central	47	36	16	36	32	16	16	5	11	[7] 0
West South Central	5	14	19	19	10	24	10	24	10	14
Mountain	28	18	9	9	0	0	9	0	0	9
Pacific	11	4	4	0	4	4	4	0	4	4

PNEUMONIA DEATH RATES

96 cities	[2] 123	[10] 105	99	95	78	87	65	74	56	[8] 75
New England	69	116	113	102	60	87	58	69	46	92
Middle Atlantic	167	130	130	109	93	95	75	83	61	90
East North Central	107	98	79	87	76	74	45	61	42	61
West North Central	55	50	57	58	32	75	51	44	40	[9] 38
South Atlantic	[2] 138	[10] 80	115	96	75	111	90	94	71	88
East South Central	116	125	58	125	95	99	110	125	89	[7] 121
West South Central	63	99	82	94	87	71	73	76	58	57
Mountain	92	146	102	82	139	100	55	109	65	46
Pacific	116	67	44	67	58	75	47	43	73	43

[2] Wilmington, N. C., not included.
[3] Grand Forks, N. Dak., not included.
[4] Spokane, Wash., not included.
[5] Grand Forks, N. Dak., Sioux Falls, S. Dak., and Covington, Ky., not included.
[6] Grand Forks, N. Dak., and Sioux Falls, S. Dak., not included.
[7] Covington, Ky., not included.
[8] Sioux Falls, S. Dak., and Covington, Ky., not included.
[9] Sioux Falls, S. Dak., not included
[10] Charleston, W. Va., not included.

Number of cities included in summary of weekly reports, and aggregate population of cities in each group, approximated as of July 1, 1925 and 1926, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1925	1926	1925	1926
Total	103	96	29, 944, 996	30, 473, 129	29, 251, 658	29, 764, 201
New England	12	12	2, 176, 124	2, 206, 124	2, 176, 124	2, 206, 124
Middle Atlantic	10	10	10, 346, 970	10, 476, 970	10, 346, 970	10, 476, 970
East North Central	16	16	7, 481, 656	7, 655, 436	7, 481, 656	7, 655, 436
West North Central	14	11	2, 594, 962	2, 634, 662	2, 461, 380	2, 499, 036
South Atlantic	21	21	2, 716, 070	2, 776, 070	2, 716, 070	2, 776, 070
East South Central	7	7	993, 103	1, 004, 953	993, 103	1, 004, 953
West South Central	8	6	1, 184, 057	1, 212, 057	1, 078, 198	1, 103, 695
Mountain	9	9	563, 912	572, 773	563, 912	572, 773
Pacific	6	4	1, 888, 142	1, 934, 084	1, 434, 245	1, 469, 144

FOREIGN AND INSULAR

THE FAR EAST

Report for week ended June 19, 1926.—The following report for the week ended June 19, 1926, was transmitted by the Far Eastern Bureau of the Health Section of the League of Nations' Secretariat, located at Singapore, to the headquarters at Geneva.

Maritime towns	Plague		Cholera		Smallpox		Maritime towns	Plague		Cholera		Smallpox	
	Cases	Deaths	Cases	Deaths	Cases	Deaths		Cases	Deaths	Cases	Deaths	Cases	Deaths
Iraq: Basra	0	0	0	0	2	2	French Indo-China:						
Ceylon: Colombo	0	0	0	0	1	0	Saigon and Cholon	4	3	13	10	0	0
British India:							Haiphong	0	0	57	56	0	0
Bombay	----	0	----	0	29	22	China: Amoy	12	----	0	0	1	0
Madras	----	0	----	0	1	1	Japan:						
Rangoon	----	2	----	9	0	0	Osaka	0	0	0	0	3	0
Karachi	----	1	----	0	9	3	Kwantung:						
Negapatam	----	0	----	0	1	1	Dairen	0	0	0	0	4	1
Dutch East Indies:							Port Arthur	0	0	0	0	6	2
Surabaja	1	1	0	0	0	0	Madagascar:						
Siam: Bangkok	1	1	86	46	3	3	Majunga	5	2	0	0	0	0

Telegraphic reports from the following maritime towns indicated that no case of plague, cholera, or smallpox was reported during the week:

ASIA

British India.—Chittagong, Cochin, Tuticorin, Vizagapatam.
Federated Malay States.—Port Swettenham.
Straits Settlements.—Penang, Singapore.
Dutch East Indies.—Batavia, Samarang, Cheribon, Belawan Deli, Palembang, Sabang, Macassar, Menado, Balik-Papan, Padang.
Sarawak: Kuching.
British North Borneo.—Sandakan.
Portuguese Timor.—Dilly.
Philippine Islands.—Manila, Iloilo, Jolo, Cebu, Zamboanga.
French Indo-China.—Turane.
China.—Shanghai, Hong Kong.
Formosa.—Keelung.
Japan.—Nagasaki, Yokohama, Moji, Kobe, Niigata, Tsuruga, Hakodate, Shimonoseki.
Korea.—Chemulpo, Fusan.
Manchuria.—Antung, Mukden, Changchun, Harbin.
U. S. S. R.—Vladivostok.

AUSTRALASIA AND OCEANIA

Australia.—Adelaide, Melbourne, Sydney, Brisbane, Rockhampton, Townsville, Port Darwin, Broome, Fremantle, Carnarvon, Thursday Island.
New Guinea.—Port Moresby.
New Zealand.—Auckland, Wellington, Christchurch, Invercargill, Dunedin.
New Caledonia.—Noumea.
Hawaii.—Honolulu.

AFRICA

Egypt.—Alexandria, Port Said, Suez.
Anglo-Egyptian Sudan.—Port Sudan.
Eritrea.—Massaua.
French Somaliland.—Jibuti.
British Somaliland.—Berbera.
Italian Somaliland.—Magadiscio.
Kenya.—Mombasa.
Zanzibar.—Zanzibar.
Tanganyika.—Dar-es-Salaam.
Seychelles.—Victoria.
Madagascar.—Tamatave.
Portuguese East Africa.—Mozambique, Beira, Lorenço Marques.
Union of South Africa.—Durban, East London, Port Elizabeth, Cape Town.

Reports had not been received in time for distribution from:

British India.—Calcutta.
Dutch East Indies.—Banjermasin, Tarakan, Pontianak.
Mauritius.—Port Louis.

SMALLPOX ON VESSEL

At Aden, Arabia.—Under date of June 12, 1926, four cases of smallpox with one fatality were reported at Aden, Arabia. The cases were stated to have been imported by sea.

BRAZIL

Mortality—Smallpox—Disease prevalence—Manaos—April, 1926.—During the month of April, 1926, 156 deaths from all causes were reported at Manaos, Brazil, including measles 1 death, smallpox 5, tuberculosis 22, bronchial affections 6, intestinal disease 25, and malaria 25 deaths.

Yellow fever.—Information received under date of June 26, 1926, relative to the yellow fever situation in Brazil states that there were no reported cases in any of the large coast cities, and that the water fronts were safe. Cases of yellow fever were reported from various places in the interior of Bahia, Pirapora, and Minas. Mosquito indices appeared to be safe except at Maranhao.

CANADA

Communicable diseases—Province of Ontario—April 26–May 29, 1926—Comparative.—During the period April 26 to May 29, 1926, communicable diseases were reported in the Province of Ontario, as follows:

Disease	1926		1925	
	Cases	Deaths	Cases	Deaths
Cerebrospinal meningitis				3
Chancroid	1			
Chicken pox	423		363	
Diphtheria	145	8	193	10
German measles	690		21	
Gonorrhea	117		215	
Influenza		30		28
Lethargic encephalitis		2		2
Measles	2,962	2	2,152	
Mumps	157		478	
Pneumonia		232		168
Poliomyelitis	1		5	2
Scarlet fever	501	6	507	6
Septic sore throat			2	
Smallpox	51	1	16	1
Syphilis	133		177	
Tuberculosis	201	84	209	92
Typhoid fever	32		53	9
Whooping cough	321	10	400	11

Smallpox.—Smallpox was reported at 16 localities, with the greatest number of cases, viz, 10, at Pakenham. At Orillia and Toronto 7 cases each were reported; at Waterloo, 6 cases, at Sarnia 4 cases, at Kitchener 3 with 1 death.

EGYPT

Plague—June 4–10, 1926—Summary.—During the week ended June 10, 1926, 5 cases of plague were reported in Egypt, making a total from January 1 to June 10, 1926, of 56 cases of plague, as compared with 64 cases reported during the corresponding period of the preceding year. Of the 5 cases reported for the week ended June 10, 2 cases occurred at Suez.

ESTHONIA

Communicable diseases—May, 1926.—During the month of May, 1926, communicable diseases were reported in the Republic of Esthonia, as follows:

Disease	Cases	Disease	Cases
Diphtheria	23	Scarlet fever	121
Leprosy	2	Smallpox	1
Measles	987	Tuberculosis	172
Paratyphoid fever	2	Typhoid fever	27

Population, 1,107,059.

JAMAICA

Smallpox (reported as alastrim)—May 30–June 26, 1926.—During the four-week period ended June 26, 1926, 99 cases of smallpox (alastrim) were reported in the island of Jamaica exclusive of Kingston. No cases of alastrim were reported at Kingston.

Other diseases.—Prevalence of other diseases was reported as follows: *Measles*—general, four cases; Kingston, 23 cases; *tuberculosis*, pulmonary, general, 44 cases; Kingston, 10 cases; *typhoid fever*, general, 43 cases; Kingston, 9 cases; *whooping cough*, general, 222 cases. Population, estimated, 1921, 858,118; population of Kingston, 62,707.

MEXICO

Mortality — Communicable disease prevalence — Durango — June, 1926.—During the month of June, 1926, four deaths from tuberculosis, all forms, and four from typhoid fever were reported at Durango, Mexico. Population, estimated, 35,000. Typhoid fever and paratyphoid were stated to be endemic. The prevailing diseases in the city and vicinity during the month of June, 1926, were stated to be dysentery, tuberculosis, typhoid fever, and whooping cough.

SALVADOR

Mortality—Communicable diseases—San Salvador—April, 1926.—During the month of April, 1926, 53 deaths from all causes, were reported at San Salvador, Republic of Salvador, including gastroenteritis 23 deaths, measles 6, tuberculosis 23, and typhoid fever 1 death. Population, 83,000.

Republic of Salvador—Mortality—Malaria.—During April, 1926, 2,710 deaths from all causes were reported in the Republic of Salvador. Population, 1,500,000. Malarial and related fevers were stated to be the prevailing diseases in the country.

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

The reports contained in the following tables must not be considered as complete or final as regards either the lists of countries included or the figures for the particular countries for which reports are given.

Reports Received During Week Ended July 23, 1926 [1]

CHOLERA

Place	Date	Cases	Deaths	Remarks
India				May 16–22, 1926: Cases, 2,174; deaths, 1,294.
Calcutta	May 23–29	58	39	
Rangoon	May 30–June 5	5	3	
Indo-China:				
Saigon	May 22–June 5	22	21	
Siam:				Stated to be for Saigon.
Bangkok	May 23–29	219	118	

[1] From medical officers of the Public Health Service, American consuls, and other sources.

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

Reports Received During Week Ended July 23, 1926—Continued

PLAGUE

Place	Date	Cases	Deaths	Remarks
China:				
Amoy	May 30–June 12	19		Deaths not reported.
Egypt				June 4–10, 1926: Cases, 5. Total, Jan. 1–June 10, 1926, 56; corresponding period, preceding year 64 cases.
India				May 8–15, 1926: Cases, 10,356; deaths, 7,466. May 16–22, 1926: Cases, 8,194; deaths, 6,423.
Bombay	May 23–29	2	2	
Karachi	June 6–12	6	5	
Madras Presidency	May 16–22	12	6	
Rangoon	May 30–June 5	2	2	
Indo-China:				
Saigon	May 23–June 5	3	1	Stated to be for Saigon.
Java:				
Batavia	May 22–28	8	8	
Siam:				
Bangkok	May 23–29	1	1	

SMALLPOX

Algeria:				
Algiers	June 1–10	6		
Brazil:				
Manaos	Apr. 1–30		5	
Para	May 30–June 19	14	14	
Rio de Janeiro	May 23–June 5	26	31	
Canada:				
Manitoba—				
Winnipeg	July 4–10	3		
Ontario—				
Kitchener	Apr. 26–May 29	3	1	
Orillia	do	7		
Packenham	do	10		
Toronto	do	7		
Waterloo	do	6		
China:				
Amoy	May 30–June 12	3		
Antung	May 31–June 13	2		
Chungking	June 6–12			Present.
Foochow	May 23–29			Do.
Hongkong	May 16–22	7	4	
Manchuria—				
An-shan	June 6–12	3		South Manchuria Ry.
Harbin	do	2		Do.
Kai-yuan	do	1		Do.
Liao-yang	do	1		Do.
Mukden	do	1		Do.
Supingkai	do	1		Do.
Shanghai	May 23–29	2		Deaths in Chinese and foreign population, international and French.
Swatow	May 30–June 5			Present in sporadic form.
Chosen:				
Fusan	May 1–31	1		
Seishin	do	2	1	
Egypt:				
Alexandria	May 29–June 10	7	2	
Esthonia				May 1–31, 1926: Cases, 1.
France:				
St. Etienne	June 9–15	2		
Great Britain:				
England—				
Nottingham	May 2–22	6		
India				May 16–22, 1926: Cases, 7,110; deaths, 1,834.
Bombay	May 23–29	26	15	
Calcutta	do	6	2	
Karachi	June 6–12	7	4	
Madras	do	1		
Rangoon	May 30–June 5	1	1	
Jamaica				May 30–June 26, 1926: Cases, 99 (reported as alastrim).
Java:				
East Java and Madoera	May 9–15	10	1	
Mexico:				
Guadalajara	June 29–July 5		1	
Torreon	June 1–30		7	

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

Reports Received During Week Ended July 23, 1926—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Portugal:				
Lisbon	May 30–June 19	10		
Siam:				
Bangkok	May 23–29	7	3	
Union of South Africa:				
Cape Province—				
Idutywa District	do			Outbreaks.
On vessels				Three cases, with one death, at Aden, Arabia, stated to have been imported by sea.

TYPHUS FEVER

Algeria:				
Algiers	June 1–10	3		
Chosen:				
Chemulpo	May 1–31	28	1	
Poland				May 9–15, 1926: Cases, 101; deaths, 5. In District of Lwow.
Tunisia:				
Tunis	June 11–20	2		

YELLOW FEVER

Brazil	Reported June 26			Present in interior of Bahia, Pirapora, and Minas.
Bahia	May 23–29	1	1	

Reports Received from June 26 to July 16, 1926 [1]

CHOLERA

Place	Date	Cases	Deaths	Remarks
Ceylon				Apr. 18–May 1, 1926: Cases, 30; deaths, 24.
French Settlements in India				Mar. 7–Apr. 10, 1926: Cases, 13; deaths, 13.
India				Apr. 25–May 15, 1926: Cases, 8,368; deaths, 5,146.
Calcutta	Apr. 4–May 22	420	379	
Madras	May 16–June 5	2	1	
Rangoon	May 9–29	18	13	
Indo-China:				
Saigon	May 2–15	52	48	
Philippine Islands:				
Manila	May 18–24	2	2	
Provinces—				
Albay	Apr. 18–24	1	1	
Mindoro	Feb. 21–27	1	1	
Siam:				
Bangkok	May 2–22	844	568	

PLAGUE

Azores:				
St. Michaels:				
Arrifes	May 9–15	1		
Livramente	May 15–29	2	1	
China:				
Amoy	Apr. 18–May 29		30	Quite prevalent.
Nanking	May 9–June 5			Prevalent.
Ecuador:				
Guayaquil	May 16–June 15	5		Rats taken, 20,877; found infected, 18.

[1] From medical officers of the Public Health Service: American consuls, and other sources. For reports received from Dec. 26, 1925, to June 25, 1926, see Public Health Reports for June 25, 1926. The tables of epidemic diseases are terminated semiannually and new tables begun.

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

Reports Received from June 26 to July 16, 1926—Continued

PLAGUE—Continued

Place	Date	Cases	Deaths	Remarks
Egypt				May 21-June 3, 1926: Cases, 12. Jan. 1-June 3, 1926: Cases, 51.
City—				
Suez	May 21-June 3	4	3	
Province—				
Beni-Suef	May 28-June 8	8	2	
Gharbieh	June 2	1	1	
Greece:				
Athens	Apr. 1-30	7	2	Including Piraeus.
Do	May 1-31	9	2	Do.
Patras	May 27	2	1	
Zante	May 17	1		
India				Apr. 25-May 8, 1926: Cases, 20,330; deaths, 16,240.
Bombay	May 2-22	9	9	
Karachi	May 23-June 5	4	4	
Madras Presidency	Apr. 25-May 15	37	35	
Rangoon	May 9-29	5	4	
Iraq:				
Bagdad	Apr. 18-May 15	107	61	
Japan:				
Yokohama	Reported July 6		3	
Java:				
Batavia	Apr. 24-May 21	39	39	
Cheribon	Apr. 11-24	3	3	
Madagascar				Apr. 1-15, 1926: Cases, 42; deaths, 39.
Moramanga Province	Apr. 1-15	2	2	Septicemic.
Tananarive Province—				
Tananarive Town	do	3	3	Pneumonic and septicemic.
Other localities	do	37	34	Bubonic, pneumonic, septicemic.
Nigeria				Feb. 1-Mar. 31, 1926: Cases, 81; deaths, 62.
Peru				May, 1926: Cases, 23; deaths, 10.
Departments—				
Ancash	May 1-31			Present.
Cajamarca	do			Do.
Ica	do	1		
Libertad	do	4		Pacasmayo, cases, 2; Trujillo district, cases, 2.
Lima	do	18	10	Lima City, 1 case; country estates, 1.
Russia				Jan. 19-Feb. 25, 1926: Cases, 7.
Senegal				Nov. 1-30, 1926: Cases, 3; deaths, 2.
Straits Settlements:				
Singapore	May 2-8	1	1	
Tunisia:				
Kairouan	June 9	3		9 cases 30 miles south of Kairouan.
Union of South Africa:				
Cape Province	May 9-22	5	3	
Orange Free State—				
Hoopstad District—				
Protestpan	May 9-22	3	3	

SMALLPOX

Algeria:				
Algiers	May 21-31	4		
Brazil:				
Para	May 16-29	6	7	
Rio de Janeiro	May 2-22	76	24	
Santos	Mar. 1-7		1	
Canada				May 30-June 12, 1926: Cases, 46.
Alberta	May 30-June 12	3		
Manitoba	May 30-June 26	24		
Winnipeg	June 6-12	5	1	
Ontario				May 30-June 26, 1926: Cases, 36.
Kingston	May 23-June 26	5		
North Bay	May 2-22	5		
Saskatchewan				May 30-June 19, 1926: Cases, 16.
Chile:				
Antofagasta	June 6-12	1		

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

Reports Received from June 26 to July 16, 1926—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
China:				
Amoy	May 1-29		8	
Chungking	May 2-29			Present.
Foochow	May 9-22			Do.
Hongkong	May 2-15	4	3	
Manchuria—				
An-shan	May 16-June 5	2		South Manchuria Railway.
Antung	May 16-22	2		Do.
Changchun	May 16-June 5	5		Do.
Dairen	Apr. 26-May 9	31	6	Do.
Fushun	do	3		Do.
Harbin	May 14-27	14		
Kai-yuan	do	1		Do.
Liao-yang	do	2		Do.
Mukden	do	1		Do.
Penhsihu	do	2		Do.
Teshihchiao	do	1		Do.
Wa-feng-tien	do	3		Do.
Nanking	May 8-June 5			Present.
Shanghai	May 2-22	7	24	Cases: foreign. Deaths, population of international concession, foreign and native.
Swatow	May 9-29			Sporadic.
Wanshein	May 1			Present among troops.
Egypt:				
Alexandria	May 15-21	5		
France	Mar. 1-31	68		
French settlements in India	Mar. 7-Apr. 10	127	127	
Great Britain:				
England—				
Bradford	May 23-29	1		
Newcastle-on-Tyne	June 6-12	1		
Nottingham	May 30-June 5	1		
Sheffield	June 13-19	1		
India				Apr. 25-May 15, 1926: Cases, 20,853; deaths, 5,336.
Bombay	May 2-22	88	48	
Calcutta	Apr. 4-22	165	150	
Karachi	May 16-June 5	29	10	
Madras	May 16-29	5	3	
Rangoon	May 9-29	6	2	
Indo-China:				
Saigon	May 9-15	1		
Iraq:				
Bagdad	May 9-29	3		
Basra	Apr. 18-May 22	20	13	
Italy				Mar. 28-Apr. 17, 1926: Cases, 10.
Japan:				
Kobe	May 30-June 5	1		
Nagoya	May 16-22		1	
Taiwan Island	May 11-20	24		
Yokohama	May 2-8	2		
Java:				
Batavia	May 15-21	1		Province.
East Java and Madoera	Apr. 11-May 8	16	1	
Malang	Apr. 4-10	6	1	Interior.
Latvia				Apr. 1-30, 1926: Cases, 3.
Mexico:				
Aguascalientes	June 13-26		5	
Guadalajara	June 8-14		2	
Mexico City	May 16-June 5	3		Including municipalities in Federal District.
San Antonio de Arenales	Jan. 1-June 30			Present. 100 miles from Chihuahua.
San Luis Potosi	June 13-26		7	
Tampico	June 1-10		2	
Torreon	May 1-31		10	
Nigeria				Feb. 1-Mar. 31, 1926: Cases, 270 deaths, 12.
Poland				Mar. 28-May 1, 1926: Cases, 12; deaths, 1.
Portugal:				
Lisbon	Apr. 26-May 23		3	
Oporto	May 23-June 5	4		
Russia				Jan. 1-31, 1926: Cases, 492.
Siam:				
Bangkok	May 2-22	8	8	
Straits Settlements:				
Singapore	Apr. 25-May 1	1		
Tunisia				Apr. 1-May 10, 1926: Cases, 6.
Union of South Africa:				
Transvaal—				
Johannesburg	May 9-15	1		

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

Reports Received from June 26 to July 16, 1926—Continued

TYPHUS FEVER

Place	Date	Cases	Deaths	Remarks
Algeria:				
Algiers	May 21-31	2	1	
Chile:				
Antofagasta	May 23-29	3		
Valparaiso	Apr. 29-May 5		1	
China:				
Ichang			1	Reported May 1, 1926. Occurring among troops.
Wanshien				Present among troops, May 1, 1926. Locality in Chungking consular district.
Chosen	Feb. 1-28	228	18	
Ireland (Irish Free State):				
Cobh (Queenstown)	May 30-June 5	1		
Cork	June 5	1		
Italy				Mar. 28-Apr. 17, 1926: Cases, 2.
Japan				Mar. 28-Apr. 10, 1926: Cases, 15.
Lithuania				Mar. 1-31, 1926: Cases, 38; deaths, 5.
Mexico:				
Mexico City	May 16-June 5	20		Including municipalities in Federal District.
Do	June 13-19	9		Do.
San Luis Potosi	June 13-26			Present, city and country.
Morocco				Mar. 1-31, 1926: Cases, 140.
Palestine				March, 1926: Cases, 6. Exclusive of Bedouin tribes and the British military forces.
Peru:				
Arequipa	Jan. 1-31		2	
Poland				Mar. 28-May 8, 1926: Cases, 680; deaths, 55.
Rumania				Mar. 1-31, 1926: Cases, 41.
Russia				Jan. 1-31, 1926: Cases, 2,956.
Tunisia				Apr. 1-May 10, 1926: Cases, 64.
Union of South Africa				April, 1926: Cases, 85; deaths, 14 (colored); European, 2 cases: Total, 87 cases, 14 deaths.
Cape Province				Apr. 1-30, 1926: Cases, 71; deaths, 11. Native.
Do	May 9-15			Outbreaks.
Grahamstown	do	1		Sporadic.
Natal				Apr. 1-30, 1926: Cases, 4. Native.
Orange Free State				Apr. 1-30, 1926: Cases, 7. Native.
Transvaal				Apr. 1-30, 1926: Cases, 3; deaths, 3. Native.
Yugoslavia:				
Zagreb	May 15-21	1		

YELLOW FEVER

Brazil:				
Bahia	May 9-22	3	2	