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ROCKY MOUNTAIN SPOTTED FEVER: VACCINATION OF MONKEYS AND MAN

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In a previous publication [1] we have shown that guinea pigs may be successfully vaccinated against Rocky Mountain spotted fever by injections of phenolized emulsions of tick virus. Data are now submitted which (1) prove that this vaccine will also protect monkeys and (2) suggest that it will confer immunity upon man.

PREPARATION OF THE VACCINE

The production of a potent vaccine from tick emulsions is dependent upon a high concentration of virus in the ticks from which it is prepared. By the injection of decreasing amounts of emulsions of infected tick viscera into guinea pigs, the minimal infectious dose of any given emulsion may be approximately determined. After many such titrations, employing fed and unfed infected ticks (*D. andersoni*) at all stages of the life cycle, it has been found that the highest concentrations of spotted fever virus occur two to four days after the beginning of the adult feeding.[2]

Such ticks, usually in lots of 100, are permitted to feed three days on guinea pigs, then at once eviscerated one by one and ground in a mortar for 10 or 15 minutes with sterile sand and a few cubic centimeters of salt solution. By this procedure the internal organs

[1] Spencer, R. R., and Parker, R. R.: Rocky Mountain Spotted Fever: Experimental Studies on Tick Virus. Pub. Health Rept., Nov. 28, 1924. (Reprint No. 976.)

[2] *Rearing of infected ticks for the preparation of the vaccine.*—The rearing of adult ticks from which the vaccine is made is a prolonged and tedious process. Potent virus can not be obtained from the tick in the same stage in which it receives the infection. Virus ingested by larvae does not increase appreciably in the engorged larvae. It is not until the next stage, or nymphs, that any increase in amount or virulence is apparent, while in the succeeding adult stage the increase is often greater than in the nymphs. The ticks which serve as culture tubes must be infected as larvae and then reared to adults; for it is in the adult ticks that the virus is most constantly of high virulence. It is therefore necessary to begin operations in the spring before that in which the vaccine is to be used. Adult males and females are selected from lots which have been reared in the laboratory and proved free from spotted fever and other infection by tests carried out during the earlier stages of the life cycle. The females are brought to full engorgement on rabbits, fertilization by the males occurring during the feeding. Each engorged female is placed in a separate pill box, assigned a lot number, and placed over moist sand. Egg deposition and hatching follow. The progeny of each of these females are carried forward as a unit. As larvae and again as nymphs each lot is permitted to engorge on a host. An infected rabbit is used for feeding the larvae and later a normal rabbit for the nymphs. After each engorgement a few ticks are injected intraperitoneally into guinea pigs to determine whether spotted fever infection has been acquired and to check again the absence of extraneous infection. After the nymphs have molted to adults they should be permitted to remain quiescent a few months, since experience has shown that recently molted adults do not as consistently yield as strong virus as those which are older.

are easily separated from the fragments of chitin which quickly settle to the bottom and a fairly homogenous emulsion is obtained. The emulsion is next diluted with sufficient salt solution so that each cubic centimeter contains the equivalent of the viscera of two or more ticks. At this stage the minimal infectious dose for guinea pigs is determined by the injection of graded dilutions, using two guinea pigs for testing each dilution. If either of the guinea pigs receiving one-thousandth of a tick fails to develop spotted fever, the material is not considered suitable for the preparation of a potent vaccine. Minimal infectious doses of one five-thousandth of a tick are preferable. The emulsion is now diluted with salt solution so that each cubic centimeter contains the equivalent of one tick, and phenol is added at the same time to make the final product contain 0.5 per cent of the preservative. The mixture is permitted to remain two or three days at room temperature. During this time a rather heavy precipitate forms and extraneous organisms are killed, as shown by subsequent anaerobic and aerobic sterility tests. The precipitate is best separated by slow centrifugation, since the emulsion does not pass readily through filter paper, and since its potency is destroyed if passed through a Berkefeld filter. The supernatant fluid, which is the material used as a vaccine, has a moderate turbidity (less than 200 parts per million).

The precipitate after drying also has been shown to possess protective qualities if reemulsified and injected into guinea pigs. No further study of this fraction has been made up to the present time.

DOSAGE

We have found it difficult to determine the minimal protective dose for guinea pigs. A small amount of a given lot of vaccine may protect one guinea pig while an equal and sometimes larger amount of the same material fails to protect another animal of approximately equal weight. In comparing the potency of two batches of vaccine, one would expect higher protection from the lot which gave the lowest minimal infectious dose before the contained virus was killed with phenol. This is not necessarily the case. Such irregularities are not surprising, however, when we recall that so little is known of the various factors affecting the process and mechanism of immunity. Typical tests upon three batches of vaccine are given below.

Typical tests on three batches of vaccine

Pig No.	Dose of vaccine[1]	Result of blood virus injection (1 c. c.) 12 days later	Pig No.	Dose of vaccine[1]	Result of blood virus injection (1 c. c.) 12 days later
Vaccine No. 130—Live virus titration=1/1,000 c. c. (1/1,000 tick) M. I. D. Prepared Apr. 2, 1925; tested Apr. 15, 1925					
	C. c.			C. c.	
1	¼	Spotted fever. Recovered.	4	½	Spotted fever. Died.
2	¼	Spotted fever. Died.	5	1	Died from secondary infection.
3	½	Immune.	6	1	Immune.
Vaccine No. 221—Titration=1/1,000 tick (M. I. D.). Prepared Mar. 31, 1925; tested Apr. 15, 1925					
7	¼	Immune.	10	½	Immune.
8	¼	Died early of secondary infection.	11	1	Do.
9	½	Immune.	12	1	Do.
Vaccine No. 223—Titration=1/5,000 tick (M. I. D.). Prepared Apr. 11, 1925; tested Apr. 15, 1925					
13	¼	Spotted fever. Recovered.	16	½	Immune.
14	¼	Spotted fever. Died.	17	1	Do.
15	½	Immune.	18	1	Do.

[1] Each dose of vaccine given in cubic centimeters also represents the same fraction of a tick.

Guinea pig No. 3 was protected by one-half cubic centimeter of vaccine No. 130, but the same amount did not protect guinea pig No. 4.

Guinea pig No. 7 was protected by one-fourth cubic centimeter of vaccine No. 221, but one-fourth cubic centimeter of vaccine No. 223 failed to protect guinea pigs No. 13 and No. 14, although this vaccine was prepared from an emulsion containing 5,000 M. I. D. per cubic centimeter as compared with 1,000 M. I. D. in vaccine No. 221.

In amounts smaller than one-fourth cubic centimeter the vaccine has frequently modified, but never completely prevented, the infection. On the other hand, 1 cubic centimeter amounts have invariably protected guinea pigs when the minimal infectious dose of the live virus emulsion was one five-thousandth cubic centimeter. More concentrated lots of vaccine so prepared that the equivalent of two ticks was contained in each cubic centimeter have been used with good results. Higher concentrations than this, however, yield emulsions of great turbidity.

The majority of our preparations have lost their protective quality after 5 or 6 weeks, but we have encountered one lot which fully protected guinea pigs in 1 cubic centimeter amounts after six months' storage in the ice box.

Guinea pigs receiving two doses of 1 cubic centimeter each have shown immunity to 1 cubic centimeter of blood virus as long as eight months. Tests for longer periods were not made.

These tests merely indicate what may be expected as to the duration of immunity, the minimal protective dose, and the keeping qualities of the vaccine. At the present time our data are too meager to justify the making of generalizations.

VACCINATION OF MONKEYS

Tables 1 and 2 show complete protection of vaccinated monkeys against 1 cubic centimeter of blood virus (500 to 1,000 M. I. D. per cubic centimeter for guinea pig) and against one-tenth cubic centimeter of tick virus (500 M. I. D.). All five control monkeys died showing a typical rash. A spleen emulsion of monkey No. 10 produced typical fever and symptoms when injected into guinea pigs. The eight vaccinated animals remained well.

TABLE 1.—*Vaccine No. 210—Vaccination of M. rhesus*

[Vaccine prepared Feb. 19, 1925; injected subcutaneously. Titer=1/5,000 tick]

No.	First dose Feb. 25, 1925	Second dose Mar. 2, 1925	Immunity test Mar. 12, 1925	Result
1	Control		1 c. c. blood virus	Mar. 25, 1925.—Dead. Typical spotted fever and rash.
2	do		do	Do.
3	do		do	Mar. 22, 1925.—Dead. Typical spotted fever and rash.
4	1 c. c.		do	Apr. 4, 1925.—Active and healthy.
5	do		do	Do.
6	do	1 c. c.	do	Do.
7	do	2 c. c.	do	Do.
8	do	do	do	Do.

TABLE 2.—*Vaccine No. 219—Vaccination of capuchin monkeys*

[Vaccine prepared Mar. 21, 1925; injected subcutaneously. Titer=1/1,1000 tick]

No.	First dose Mar. 25, 1925	Second dose Apr. 1, 1925	Immunity test Apr. 11, 1925	Result
9	Control		1/10 c. c. tick virus	Apr. 21.—Dead. Typical spotted fever.
10	do		do	Do.
11	1.5 c. c. vaccine.	1.5 c. c. vaccine.	do	Remained well; discharged June 1.
12	do	do	do	Do.
13	do	do	do	Do.

EXPERIMENTAL VACCINATION OF MAN

In investigations of Rocky Mountain spotted fever or other disease transmitted by insect vectors, no attempt has been made, so far as we are aware, to protect man by inoculating material from an intermediate host. Breinl[3] has shown that guinea pigs may be protected against typhus fever by injecting phenolized emulsions of infected lice, but the method was not applied to man.

[3]Breinl, F.: Studies on Typhus Virus in the Louse. Jour. of Inf. Dis., January 1924, vol. 34, No. 1, pp. 1-12

Up to the present time a total of 34 people, chiefly laboratory and field workers in Rocky Mountain spotted fever and others whose occupations expose them to infection, have been vaccinated. Each lot of vaccine for human use was first tested for sterility, following the Hygienic Laboratory technique required for biologic products, and for protective quality and harmlessness by injection into guinea pigs.

The vaccine was administered subcutaneously in doses of 1 or 2 cubic centimeters each at five-day intervals. Some have received two, some three, and some four injections. No severe reactions have been encountered. The total number of M. I. D. for guinea pigs per vaccinated individual has varied from 2,000 to 17,500. The greatest number used for one injection has been 10,000. The vaccines used have contained 1,000, 5,000, and 10,000 M. I. D. of killed virus per cubic centimeter.

Local redness, swelling, and heat, reaching a maximum within 48 hours, is the rule. Slight headache and muscular pains occurred in a few instances, but no elevations of body temperature developed, and all persons vaccinated carried on their duties as usual. The reactions following the first injection have been exceedingly mild, but in some individuals they increased in intensity and duration after the last injection, suggesting an increasing sensitiveness.

One person who gave a history of extreme sensitiveness to the bite of insects developed a general itching, with watering of the eyes, almost immediately following the first injection. For two weeks there appeared and disappeared several crops of an urticarial rash, accompanied by itching. The condition, however, did not interfere with the performance of his regular duties. An intradermal injection of one-tenth cubic centimeter of the vaccine given two weeks later was followed immediately by an urticarial wheal 1 inch in diameter. It is believed that the intradermal test may be used to detect any sensitive individual and thus avoid severe reactions.

DEMONSTRATION OF PROTECTIVE BODIES IN THE SERUM OF VACCINATED ANIMALS AND OF MAN

On May 22, 1924, 1 cubic centimeter of serum from each of 12 normal Belgian rabbits was mixed with 1 cubic centimeter of guinea pig blood virus and immediately injected intraperitoneally into guinea pigs. All of these animals developed typical spotted fever, from which only one recovered, demonstrating that the normal rabbit sera contained no virus-neutralizing substances. The rabbits were subsequently each given subcutaneously three injections of vaccine (May 22, May 26, and June 13). On August 21, 2 rabbits having died of intercurrent infection, 1 cubic centimeter of the serum of each of the remaining 10 was again mixed with 1 cubic centimeter of blood

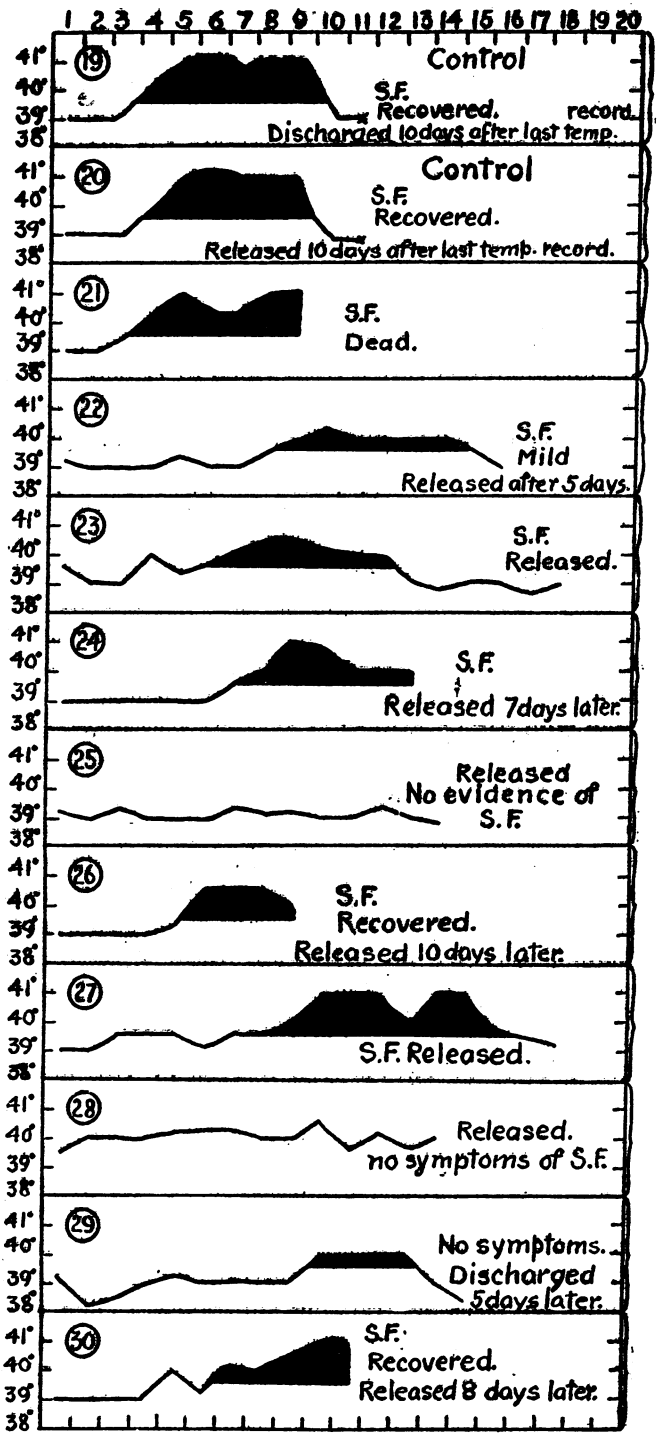


CHART 1.—Daily temperatures of guinea pigs injected with mixtures of serum from vaccinated rabbits and blood virus. (Temperatures above 39.6° C. are regarded as definite fever, and areas between this line and the temperature curve are shaded in black.)

virus and immediately injected into fresh pigs. The sera of two fresh rabbits were used as controls. Chart No. 1 gives the results of these inoculations. The sera of the controls (Nos. 19 and 20) and of one of the vaccinated rabbits (No. 21) did not apparently affect the virus. However, two of the guinea pigs (No. 25 and No. 28) developed no symptoms of fever and all the others gave a markedly delayed incubation period.

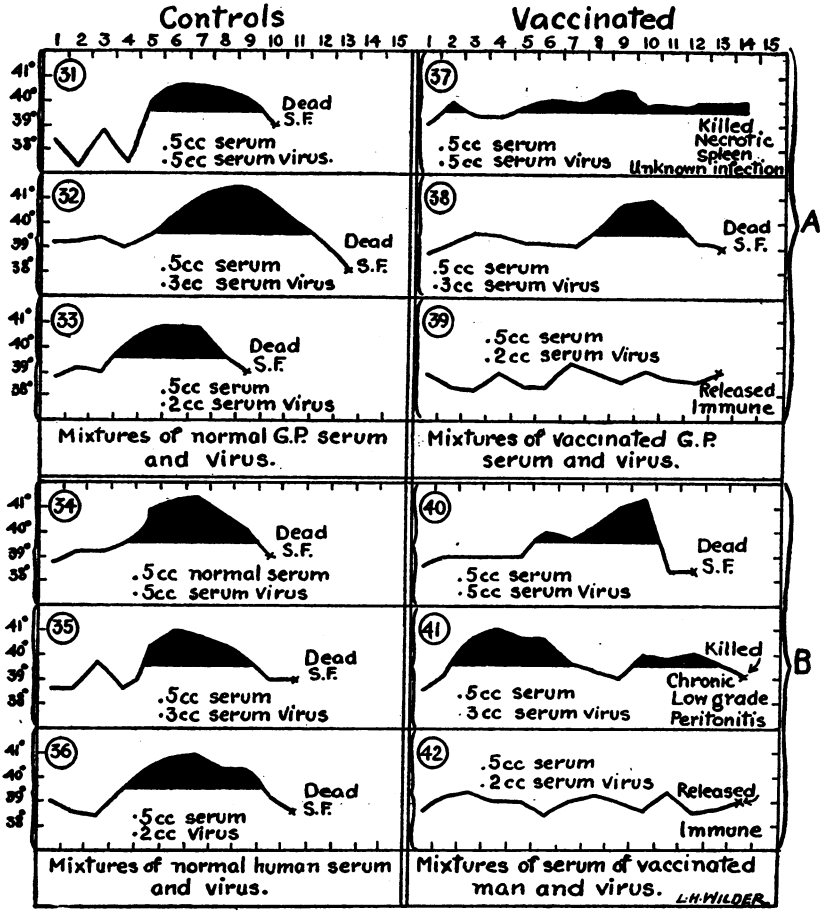


CHART 2.—Daily temperatures of guinea pigs injected with (A) mixtures of serum from vaccinated guinea pigs and decreasing amounts of blood virus, and (B) mixtures of serum from vaccinated man and decreasing amounts of blood virus

Chart No. 2 gives the result of injecting into guinea pigs mixtures of blood virus with (1) serum from vaccinated guinea pigs and (2) with serum from vaccinated man. This time the mixtures were permitted to remain one hour at room temperature before inoculating.

Guinea pigs No. 31, No. 32, and No. 33 were injected with mixtures of normal guinea pig serum and virus. Guinea pigs No. 34, No. 35, and No. 36 were injected with mixtures of normal human serum and

virus. All six of these control animals died promptly of spotted fever. Guinea pigs No. 39 and No. 42 show that 0.5 cubic centimeter of serum of a vaccinated guinea pig and of a vaccinated man neutralizes 0.2 cubic centimeter of blood virus. The human serum had been tested before vaccination and showed no virus-neutralizing effect.

PROBABLE MODIFICATION OF ROCKY MOUNTAIN SPOTTED FEVER IN A VACCINATED PERSON

On April 8, 1925, E. O. E., of Stevensville, Mont., age 43, engaged in cattle dipping for the Montana State Board of Entomology, was given 1 cubic centimeter of vaccine No. 218. At the same time several other men were given injections from the same vial. Five days later E. O. E. was given another injection of 1 cubic centimeter in the opposite arm. On the morning of April 16, eight days after the first injection, he arose tired and drowsy, with a slight headache and muscular pains. The following day the symptoms were more severe, and in the evening, about 7 p. m., he had a chill and went to bed. On the 19th the family physician, Dr. W. P. Reynolds, of Stevensville, noticed small scattered hyperemic spots on the ankles and abdomen. On the 21st there was nosebleed and the temperature had reached 103.8° F. A diagnosis of Rocky Mountain spotted fever was made, although no definite history of tick bite could be obtained. The patient's occupation, however, had continually exposed him to the bites of partially fed adult ticks which he had been removing from cattle and horses by "hand picking." Such fed ticks can infect far more readily than unfed ticks. This has been previously shown by us experimentally.[4]

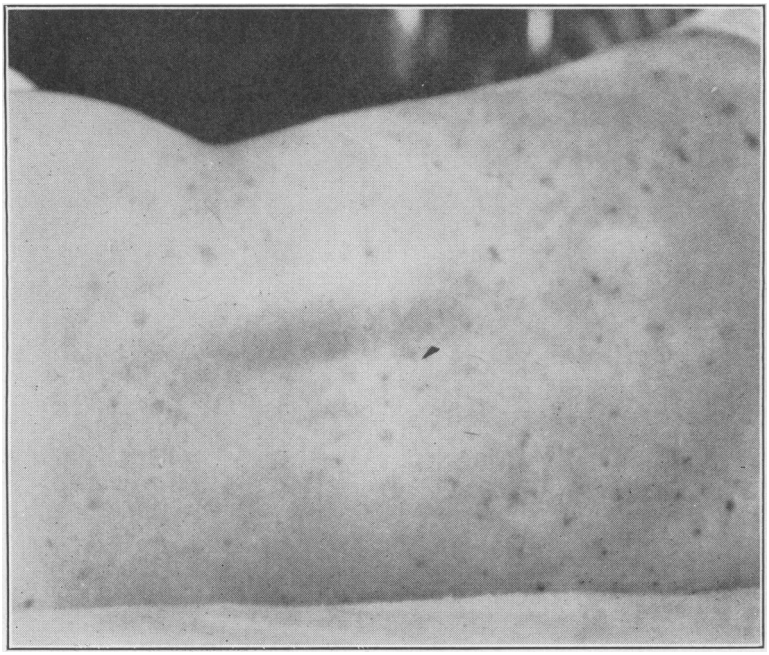
The interesting features in this case are:

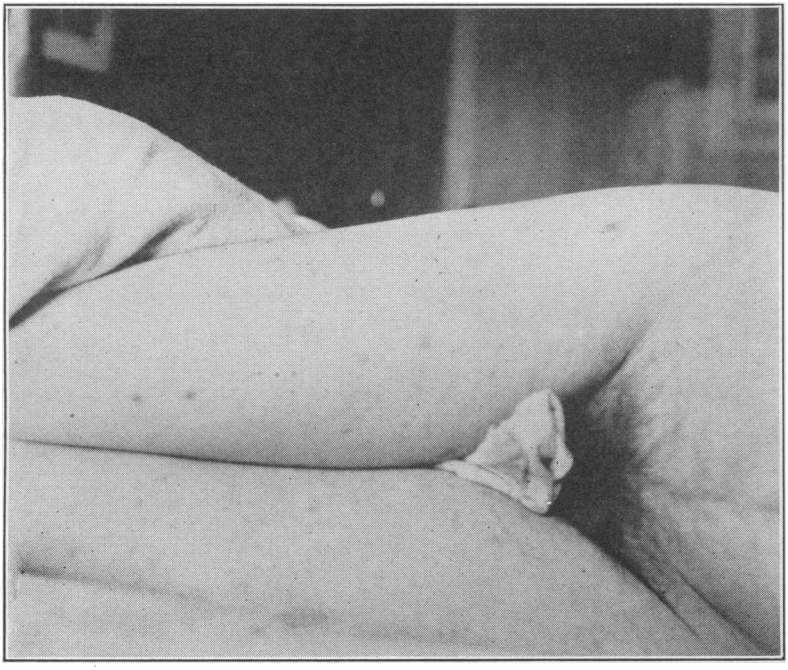
1. The course of the disease was mild, and the patient was never considered in danger.
2. Although convalescence was prolonged, the patient recovered. Four other cases—all that occurred this year in the Bitter Root Valley—were all fatal within 10 days.
3. The rash was scattered and far less marked than in any other cases we have seen in this region (see Pl. II).
4. Three guinea pigs injected with blood from the patient failed to show spotted fever. This has happened, however, in other typical cases, but never in those of a severe character.

It is, of course, impossible to state that the vaccine modified the course and severity of the infection. Vaccine No. 218 was prepared on March 18, 1925, from a tick emulsion which gave a titer of one one-thousandth tick as the M. I. D. On March 25 it protected guinea pigs in one-half cubic centimeter amounts.

[4] Spencer, R. R., and Parker, R. R.: Rocky Mountain Spotted Fever: Infectivity of Fasting and Recently Fed Ticks. Pub. Health Rep., Feb. 23, 1923, pp. 333-339. Reprint No. 817.

Fatal case of Rocky Mountain spotted fever; photograph taken about the eighth day. Many cases in the Bitterroot Valley, Montana, die before the rash has developed to this stage.—(Courtesy of Surg. L. D. Fricks)





Appearance of rash on eighth day in a case of Rocky Mountain spotted fever which was probably modified by vaccination

The time required for an immunity to develop has varied considerably in vaccinated guinea pigs. We have regarded 10 days as a minimum period. We are therefore unable to draw any definite conclusions as to the efficiency of the vaccine from this case, but believe the circumstances as reported are worthy of note.

We see no reason why injections may not be repeated each spring in persons whose occupations definitely expose them to infection. It would be impracticable to vaccinate the general population of the spotted fever region, but it is believed that the vaccine affords a means of protection for all those necessarily exposed to the infection and who choose to avail themselves of it. This would include residents and vacationists in badly infected areas, laboratory and field workers in Rocky Mountain spotted fever, foresters, lumbermen, sheep herders, surveyors, hunters, prospectors, and fishermen.

SUMMARY

1. The technique for the preparation of a protective vaccine against Rocky Mountain spotted fever from infected adult ticks is given.

2. The potency, keeping qualities, and duration of immunity induced by this vaccine have been estimated within certain limits.

3. The vaccine will protect guinea pigs, rabbits, and monkeys.

4. The vaccine has been administered to 34 adults with no severe reactions.

5. Virus-neutralizing substances can be demonstrated in the serum of vaccinated guinea pigs, rabbits, and man.

6. The course and outcome of a case of Rocky Mountain spotted fever developing eight days after the first dose of vaccine suggests that the infection was modified.

RELATIVE VALUES OF METHODS OF ENUMERATING BACTERIA IN AIR [1]

By W. J. McCONNELL, Passed Assistant Surgeon (R.), United States Public Health Service, Surgeon, United States Bureau of Mines, and B. G. H. THOMAS, Junior Pathologist, United States Bureau of Mines.

Several practical and efficient instruments for collecting dusts in various atmospheres have been perfected during the past few years, and the Bureau of Mines was requested to compare some of these methods as to their efficiency in collecting bacteria in the air. Experiments were conducted with four different methods, and results were compared with the standard sand method [2] approved by the Committee on Standard Methods for the Examination of Air.

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[1] Work done in cooperation with U. S. Bureau of Mines.

[2] Final Report of the Committee on Standard Methods for the Examination of Air. Am. Jour. Pub. Health, vol. 7, 1917, p. 54.

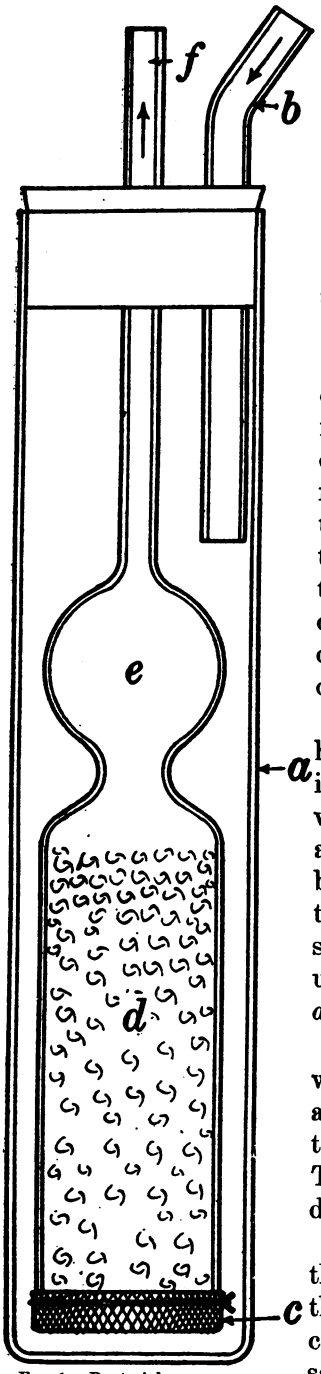

FIG. 1.—Bacterial aeroscope

Instruments Used and Operating Conditions

The instruments tested in these experiments were the Anderson-Armspach dust determinator,[3] the Greenburg-Smith impinger,[4] sugar tubes, and a modified water aeroscope. The aeroscope was devised by the junior writer and made by the Bureau of Mines at Pittsburgh. It consists essentially of a container and an aeroscope as illustrated in Figure 1.

In operating the instruments suction was obtained by using a rotary vane pump connected in such a manner that any amount of air could be drawn through the instrument. The amount of air passed through the filters was determined by the time and the rate of flow, a flowmeter being used between the pump and the instrument. One cubic foot per minute was the rate of flow of air used in the impinger method and 0.4 cubic foot per minute in the other methods.

All experiments were conducted under a hood. A suspension of bacteria was sprayed into the hood by means of an atomizer, which was attached to a positive pressure air line for a period of 10 seconds at the beginning of each experiment. The air in the hood was kept in motion while the samples were being taken. The organisms used were *Bacillus coli* and *Staphylococcus albus*.

The media used to grow the organisms was either beef-extract broth or beef-extract agar, containing 2.5 per cent agar, adjusted to hydrogen ion concentration of pH 7.4. The cultures were incubated at 37° C. for 3 days before they were recorded.

In order to obtain comparable results for the different methods used on any one day, they were alternated so that the average conditions would be approximately the same.

[3] Ingels, Margaret: New Data on Air Dust Determinations. Jour. Am. Soc. Heat. and Vent. Engrs., March, 1923, February, 1924, and January, 1925.

[4] Greenburg, L. and Smith, G. W.: A New Instrument for Sampling Aerial Dust. Bureau of Mines Report of Investigations. Serial No. 2392, 922.

DESCRIPTION OF AND PROCEDURE WITH WATER AEROSCOPE

The container *a* consists of a cylindrical glass tube 240 mm. in length and 50 mm. in diameter, closed at the bottom and fitted at the top with a rubber stopper through which two openings were made for the insertion of tubes *b* and *f*. The inner tube is also glass and consists of a lower portion *d*, which is 105 mm. in length and 30 mm. in diameter and contains water. The upper portion of the tube is constricted to a diameter of 10 mm. and expands into the trap *e*, which is 35 mm. in diameter. This in turn continues into the exit tube *f*, which is 100 mm. in length and 6 mm. in diameter. The lower end of the tube is covered with a piece of Japanese silk *c* and fastened by means of a cord to the edge of the tube. The small curves in tube *d* represent the water broken up into bubbles when the apparatus is in use. The intake tube *b* is 6 mm. in diameter and 105 mm. in length, of which the upper 35 mm. was bent at an angle of 45°.

In preparing the water aeroscope for use, approximately 25 c. c. of distilled water was put into the container *a*, and the openings *b* and *f* were plugged with cotton. It was then sterilized in an autoclave for 20 minutes at 15 to 18 pounds pressure. Before using the instrument the cotton plugs were removed and tube *f* was connected by means of rubber tubing to a suction device. The air was drawn through the inlet tube *b* and through the water in the container, which in turn was lifted into tube *d* as a foamy mass. The bacteria are caught in the bubbling water. At the end of the test 1 c. c. of the water was plated out in a petri dish and the volume of the remainder was determined. This amount, plus the 1 c. c. removed, gave the dilution factor to be used in conjunction with the volume of air filtered when calculating the number of organisms in the air.

PROCEDURE WITH AIR DUST DETERMINATOR

When using the air dust determinator the pressure gage was disconnected and the A. D. Little quantitative filter paper was sterilized. The paper was treated in the following manner in order not to render it brittle: Each sheet was wrapped in a newspaper, autoclaved at 15 to 18 pounds pressure for 15 minutes and then dried at 37° C. dry heat. In a few preliminary experiments, five consecutively numbered sheets were used simultaneously, and these were sterilized in one package. The filter paper was handled only with sterile instruments.

Cultures were made from the central area, 2 cm. square, of each sheet. In the quantitative experiments, these squares of paper were placed in a sterile 100 c. c. Erlenmeyer flask containing 10 c. c. of distilled water. The contents of the flask were repeatedly shaken for 30 minutes in order to set the bacteria free; 1 c. c. of this water

was plated as in a water examination for bacteria. The three factors used for calculating the number of organisms were as follows: The proportional area of the exposed paper that was cultured, the dilution factor, and the volume of air filtered.

PROCEDURE WITH SAND AEROSCOPE

Samples of air containing bacteria were collected with the sand aeroscope, as recommended in the final report of the Committee of Standard Methods for the Examination of Air. The sand used had a fineness of 100 to 200 mesh and was sterilized at 165° C. dry heat for 60 minutes. Following the collection, the sand was poured into a small sterile Erlenmeyer flask containing 10 c. c. of distilled water. The mixture was repeatedly shaken for a period of 30 minutes, and 1 c. c. of the bacteria-laden water was cultured.

PROCEDURE WITH SUGAR AEROSCOPE

In a few experiments the sand was replaced by granulated sugar (saccharose). These experiments proved very unsatisfactory on account of the difficulty of sterilizing the sugar. When dry heat was used, the sugar became caramel, and with moist heat it became a solid homogenous white mass. This solid mass of sugar greatly impeded the flow of air and dissolved very slowly in distilled water from which cultures were made.

PROCEDURE WITH IMPINGER TUBE

The Greenburg-Smith impinger tube was next compared with the sand method. The same procedure was employed in collecting bacteria as is used in collecting dust, except that the tube was autoclaved. At the end of each test 1 c. c. of the sample was plated. The dilution factor was obtained by adding the amount used for culturing plus the volume of water remaining in the apparatus.

Comparative Tests

In using the dust determinator it was at first necessary to determine whether the paper would retain the organisms. Four or five sheets of filter paper numbered consecutively were used in the preliminary tests. The center square of each sheet was cultured separately in beef-broth extract. Table 1 illustrates the results of these tests.

TABLE 1.—*Results of tests of dust determinator to determine organisms retained by filter paper*

Date	Experiment No.	The individual sheet that was positive	The individual sheets that were negative
Aug. 3, 1923	F 1	Fourth	First, third, and fifth (paper No. 2 dropped).
Do	F 2	First	Second, third, fourth, and fifth.
Do	F 3	do	Do.
Sept. 8, 1923	F 4	do	Second, third, and fourth.
Do	F 5	do	Do.
Do	F 6	do	Do.
Do	F 7	do	Do.
Do	F 8		First, second, third, and fourth.

It will be observed that the first filter paper retained all the bacteria, which leads us to the conclusion that if any bacteria escapes the first filter paper they pass also through the remaining sheets.

A group of experiments was next conducted in which the methods studied were compared with the sand method. On four occasions no bacteria were sprayed into the air, and the bacterial count was practically zero. The data of the sand, filter paper, water, and impinger methods are given in Table 2, with the exception of those from the sugar tube. Of the latter group only two experiments were conducted, as it was not found to be practicable because of the hardness of the sugar after steam sterilization and the formation of caramel when dry heat was used.

TABLE 2.—*Results of various methods of collecting bacteria from air*

Date	Sand method			Filter-paper method			Modified water method			Impinger method		
	Experiment No.	Plate count	Bacteria per cubic meter	Experiment No.	Plate count	Count per cubic meter	Experiment No.	Plate count	Count per cubic meter	Experiment No.	Plate count	Count per cubic meter
Nov. 27, 1923	1 F 1	0	0	F 9	0	0						
	1 F 2	0	0	F 10	0	0						
	1 F 3	0	0	F 11	0	0						
	1 F 4	2	141	F 12	0	0						
Average		0.5	45		0	0						
Nov. 30, 1923	1 F 5	(1)	(1)	F 13	(1)	(1)						
	1 F 6	(1)	(1)	F 14	(1)	(1)						
	1 F 7	(1)	(1)	F 15	(1)	(1)						
			(1)	F 16	(1)	(1)						
Average		(1)	(1)		(1)	(1)						
Dec. 4, 1923	1 F 8	0	0	F 17	0	0	11 F 1	2	140			
	1 F 9	0	0	F 18	0	0						
Average		0	0		0	0		2	140			
Dec. 7, 1923	1 F 10	221	15,600	F 19	1,600	537,000	11 F 2	(1)	(1)			
Average		221	15,600		1,600	537,000		(1)	(1)			
Dec. 10, 1923	1 F 11	175	15,400	F 20	210	70,500	11 F 3	220	155,000			
	1 F 12	34	2,400	F 21	91	30,500						
Average		105	8,900		150	55,000		220	155,000			
Dec. 11, 1923	1 F 13	24	1,690	F 22	323	109,000	11 F 4	521	71,500			
	1 F 14	232	16,400	F 23	47	15,750	11 F 5	258	117,000			
	1 F 15	216	15,200	F 24	364	122,000						
	1 F 16	450	37,000	F 25	308	105,000						
Average		230	17,570		260	87,940		389	94,250			
Dec. 17, 1923	1 F 17	36	3,000	F 26	82	27,500	11 F 6	149	105,000			
	1 F 18	349	30,900	F 27	155	52,000	11 F 7	128	95,000			
Average		192	16,950		118	39,750		188	100,000			
Dec. 18, 1923	1 F 19	5	350	F 28	39	13,100	11 F 9	267	141,000			
	1 F 20	20	1,400	F 29	83	27,700	11 F 10	584	61,900			
	1 F 21	69	4,870	F 30	78	26,100	11 F 11	758	80,300			
Average		31	2,206		67	22,300		536	94,060			

Jan. 24, 1924	1 F 22	0	0				11 F 12	0	0	IV F 1	0	0
	1 F 23	0	0				11 F 13	0	0	IV F 2	0	0
	1 F 24	5	424				11 F 14	0	0			
Average		2	141					0	0		0	0
Apr. 29, 1924	1 F 25	1	88				11 F 15	1,096	126,000	IV F 3	0	0
	1 F 26	0	0				11 F 16	214	37,900	IV F 4	0	0
	1 F 27	1	88				11 F 17	11	2,050			
Average		1	58					440	55,320		0	0
May 1, 1924	1 F 28	0	0				11 F 18	0	0	IV F 5	0	0
	1 F 29	0	0				11 F 19	0	0	IV F 6	0	0
Average		0	0					0	0		0	0
May 5, 1924	1 F 30	36	3,160				11 F 20	108	21,000	IV F 7	2	3,070
	1 F 31	77	6,780				11 F 21	684	78,400	IV F 8	4	6,569
Average		56	4,970					396	49,700		3	4,785
May 9, 1924	1 F 32	20	1,760				11 F 22	(1)	(1)	IV F 9	1	1,225
	1 F 33	320	28,300				11 F 23	(1)	(1)	IV F 10	2	3,300
Average		170	15,030					(1)	(1)	IV F 10	2	2,263

[1] Too numerous to count.

It will be observed that the methods employing filter paper and water are approximately ten times more efficient than the standard sand method. The results of the impinger method indicate that it is not suitable for determining bacteria in the air. The organisms which were sprayed into the air were not recovered. On the three

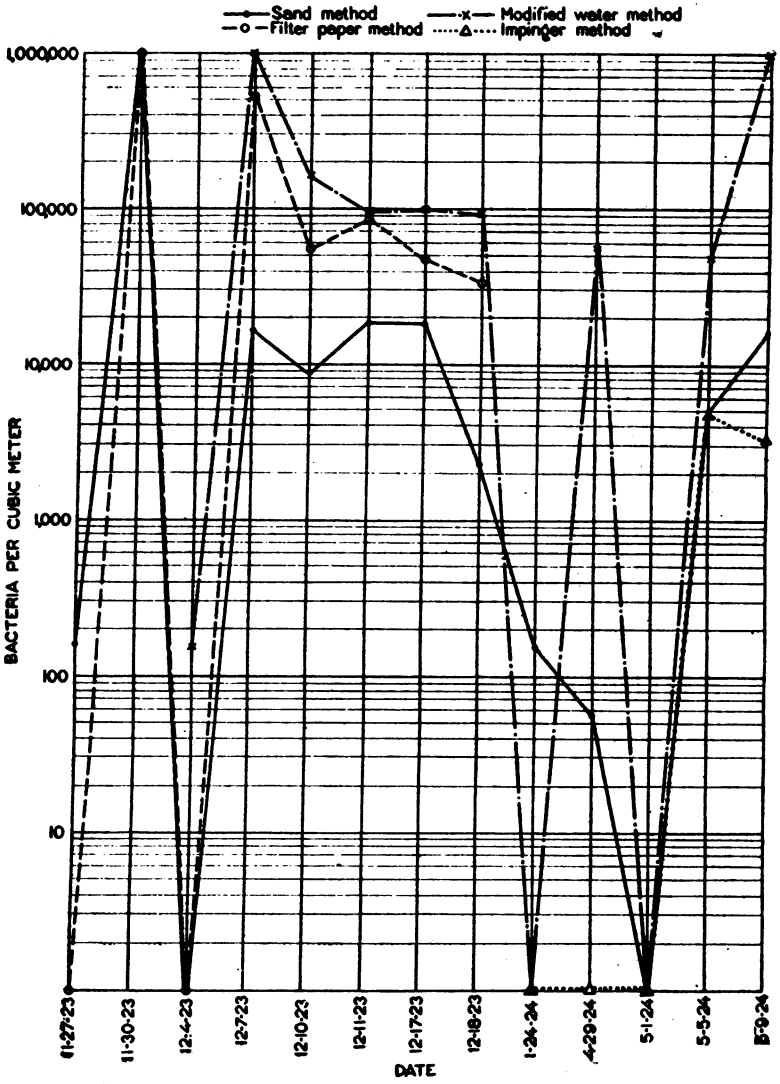

FIG. 2.—Average day's count per cubic meter for a given method

days when the impinger was used after a number of bacteria had been sprayed into the air, as shown by the water method, the plate count was either zero or not more than four. The colonies that grew on the plate were not of the organisms that were sprayed into the air.

In order to make more obvious the relative efficiency of the various methods, the average day's count for each method is plotted in Figure 2.

Test of Efficiency of Water Aeroscope

After completing the series of tests, a few experiments were conducted to determine, first, whether any bacteria passed through the modified water aeroscope, and second, whether the majority of organisms collected by the filter-paper method were in the center or in the periphery of the paper.

The first was determined by inserting a sterile cotton plug in the exit tube during the test, washing the cotton well in sterile water, and culturing 1 c. c. of the water. The results are given in Table 3.

TABLE 3.—*Percentage of bacteria passing through the modified water aeroscope*

Experiment No.	Total count from aeroscope	Total count from cotton plug	Per cent passed through
11 F 3	4,400	30	0.68
11 F 4	8,336	220	2.64
11 F 5	3,354	20	0.59
11 F 7	2,688	0	0.00
11 F 8	4,968	10	0.20
11 F 9	4,005	40	1.00
Average			0.85
Total	27,751	320	1.15

The number of organisms passing through the aeroscope is almost negligible. The average percentage passing through in the different experiments is 0.85 per cent, and the calculated percentage of the total count is 1.15 per cent, which is likewise negligible.

The second inquiry was determined by making a culture of both the center and the margin of the exposed filter paper. Two tests were conducted, and the results show that, in the first test, the margin contained only 85.4 per cent of the number of organisms found in the center of the paper, and in the second test, 83.8 per cent. While these two tests provide insufficient data to serve as a basis for conclusions, they indicate a possible error airising when culturing the small central area.

Advantages and Disadvantages of Instruments

FILTER PAPER

From a comparison of the results of the different methods of collecting bacteria from the air it is seen that the modified water aeroscope and the filter-paper methods are the more efficient. The latter has the advantage that, if the paper is placed in a sterile

container, it can be shipped with safety. It is probably not the most advantageous method for several reasons. First, it requires a special apparatus equipped with a filter-paper holder. Second, contamination may occur when the container is opened; when the paper is put in or removed from the machine and placed in the original container; and especially when nonsterile instruments or fingers are used in the handling of the filter paper. Third, preparation of the paper requires both moist sterilization and slow drying to prevent brittleness.

SAND AEROSCOPE

In contrast, the sterilization of the sand aeroscope is much simpler and can be performed in one operation. Moreover, the sand tube can be shipped by sealing the ends with a wax cap or a rubber tube and clamp. This method, however, requires grinding and sizing of the sand. Its greatest disadvantage is that it builds up a high resistance when using a rapid rate of flow.

MODIFIED WATER AEROSCOPE

The modified water aeroscope shares all the advantages and none of the disadvantages of the sand method. Likewise, the modified method possesses several advantages over Rettger's [5] water aeroscope, which he claims to be as efficient as the sand method. In Rettger's aeroscope the air is drawn in a long narrow tube instead of a short one. This is an important feature, because Rettger found that bacteria clung to the inner wall of this long narrow tube. Second, the openings in his aeroscope are few and comparatively large as compared with the modified water aeroscope. The smaller openings of this instrument assure smaller air bubbles, and thus the contents of the bubbles are more easily moistened and consequently the bacteria will be more readily caught in the water. The greater total area of openings in the modified method permits the air to be drawn through it more than 10 times as rapidly as was considered practicable in the unmodified form which permits a liter of air per minute.

IMPINGER

The low counts obtained with the impinger indicate the difficulty in recovering the organisms used in these experiments when the rate of suction is 1 cubic foot per minute.

In an effort to seek an explanation why the organisms were not recovered with the impinger, our attention was attracted to the experiments conducted by Larson and his colleagues [6] on the effect of high

[5] Rettger Method of Determining Bacteria in the Air, Using Salt Solution. Jour. Med. Research, Vol. 22, June, 1910, pp. 461–468.

[6] Larson, W. P., Hartzell, T. B., and Diehl, H. S.: The Effect of High Pressures on Bacteria. Jour. of Infec. Dis., Vol. XXII (1918), pp. 271–279.

pressure on bacteria, and in particular his conclusion that the sudden release of the pressure, thereby changing the osmotic tension of the fluid in which the bacteria were suspended, was the factor which destroyed the organisms.

The impinger differs from the methods used by Larson in that instead of exerting a constant pressure and suddenly releasing, the suspension of organisms is impacted with a sudden increase in pressure and instantly released.

In an attempt to estimate the amount of pressure due to impact, Dr. M. D. Hersey, physicist of the Bureau of Mines, supplied the following comments on the problem:

"If the bacteria consist of soft particles of about the density of water and are caused to impinge against a metal surface at right angles to the air jet in which they are carried along in suspension, a certain amount of pressure will be developed during the moment of impact.

"A limiting case, which lends itself to calculation, may be described by assuming the metal plate to be perfectly rigid while the moving particle possesses no rigidity or resistance whatever to deformation. It will be assumed to act like a perfect liquid, free from viscosity or elasticity. In this case the impact pressure will be due solely to the inertia of the bacteria.

"Under the above conditions the formula required is

$$p = \tfrac{1}{2}\rho v^2$$

where p will come out in pounds per square foot if the density, ρ, is taken in slugs per cubic foot, while v is in feet per second (one slug = 32.2 pounds mass).

"Taking the density of the particle to be the same as water, about 1.9 slugs per cubic foot, and if the velocity is 370 feet per second (the air was found to leave the impinger nozzle at the rate of 373 feet per second), the formula above gives for the impact pressure about 130,000 pounds per square foot, which amounts to 900 pounds per square inch.

"In so far as the particle possesses internal rigidity or hardness, the true pressures experienced will be greater than those calculated above, approaching infinity if both the metal surface and the particle are assumed to be absolutely undeformable.

"Probably 1,000 pounds per square inch would be a conservative estimate of the impact pressure; and for velocities greater or less than 370 feet per second, the pressure would vary in proportion to the square of the speed."

A suggested explanation that, in the short process of the experiment, enough copper was dissolved from the brass plate of the impinger to kill the organisms was easily proved untenable by success-

fully growing cultures of bacteria after having left organisms in contact with the impinger plate 24 hours. It is likewise commonly known that brass plumbing does not prevent the growth of organisms.

The most plausible explanation lies in the hypothesis that the organisms (based on Larson's experiments) were killed in the collection by the impinger.

TESTING THE AEROSCOPE

There are several possible methods of testing an aeroscope. It is true that it is almost impossible to obtain strictly comparable results for the different methods if they are run parallel or alternately. If, however, a number of tests are made, the error due to dissimilar conditions becomes less when an average of each group is made. Ruhle,[7] on the other hand, considered the proper method of testing to use the two tubes in tandem and thus determine the percentage of organisms that passed through the first tube. This method is very good provided that it is only a question of filtering and not one of enumerating the bacteria in the air. A given method may retain the organisms perfectly and yet the count may be far lower than it should be. This is due to two processes that are combined in determining the number of organisms in the air; one is catching the organisms and the other is setting them free in the media in which they are to be cultured. It is very probable that the organisms caught in the fine sand are not readily set free when the sand is poured into the water or a physiological salt solution. Thus, when a portion of the suspension is cultured, it does not give a true representative number of the organisms caught in the sand.

Conclusions

The experiments performed indicate that—

1. The modified water aeroscope is approximately ten times more efficient than the standard sand method. It is relatively free from error and contamination and is easily prepared.

2. The Anderson-Armspach (filter paper) dust determinator is approximately ten times more efficient than the standard sand method, but is open to errors through contamination, and the method of preparing the filter paper is quite tedious.

3. The experiments conducted with the impinger indicate that this instrument is not suitable for enumerating the bacteria in air when the rate of flow is 1 cubic foot per minute.

4. The sugar tube is impractical as an aeroscope.

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[7] Ruhle, G. L. A.: Methods of Bacterial Analyses o Air. Jour. of Agricultural Research, Department of Agriculture, Vol. 4 (1915) p. 343.

DEATHS DURING WEEK ENDED SEPTEMBER 26, 1925

Summary of information received by telegraph from industrial insurance companies for week ended September 26, 1925, and corresponding week of 1924. (From the Weekly Health Index, September 29, 1925, issued by the Bureau of the Census, Department of Commerce)

	Week ended Sept. 26, 1925	Corresponding week, 1924
Policies in force	60, 828, 114	57, 044, 556
Number of death claims	10, 180	9, 497
Death claims per 1,000 policies in force, annual rate	8. 7	8. 7

Deaths from all causes in certain large cities of the United States during the week ended September 26, 1925, infant mortality, annual death rate, and comparison with corresponding week of 1924. (From the Weekly Health Index, September 29, 1925, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Sept. 26, 1925		Annual death rate per 1,000 corresponding week, 1924	Deaths under 1 year		Infant mortality rate week ended Sept. 26, 1925 [2]
	Total deaths	Death rate [1]		Week ended Sept. 26, 1925	Corresponding week, 1924	
Total (67 cities)	5,750	10.8	[3] 10.9	893	[3] 718	[4] 76
Akron	32			7	5	78
Albany [5]	42	18.3	13.6	4	4	87
Atlanta	75			10	7	
Baltimore [5]	185	12.1	10.8	40	25	120
Birmingham	53	13.4	14.3	7	8	
Boston	171	11.4	12.4	27	29	71
Bridgeport	21			4	3	64
Buffalo	127	12.0	14.2	23	24	93
Cambridge	18	8.3	14.0	2	5	34
Camden	27	10.9	11.6	4	5	64
Canton	12	5.9	6.1	2	1	42
Chicago [5]	576	10.0	10.2	95	76	84
Cincinnati	108	13.8	14.3	20	15	118
Cleveland	171	9.5	8.2	24	25	60
Columbus	69	12.9	13.4	17	8	156
Dallas	38	10.2	12.5	7	6	
Dayton	23	6.9	8.3	5	4	79
Denver	78	14.5	15.8	20	11	
Des Moines	25	8.7	9.0	3	2	51
Detroit	210			50	40	86
Duluth	20	9.4	7.7	4	1	86
El Paso	29	14.4	12.4	6	6	
Erie	19			5	5	97
Fall River [5]	25	10.8	12.5	3	5	43
Flint	23	9.2	7.1	7	4	111
Fort Worth	26	8.9	9.9	3	5	
Grand Rapids	33	11.3	9.8	5	2	79
Houston	36	11.4	12.1	3	7	
Indianapolis	74	10.8	11.6	8	11	57
Kansas City, Kans	27	11.4	9.0	4	1	84
Kansas City, Mo	85	12.1	10.4	9	12	
Los Angeles	181			9	17	25
Louisville	90	18.1	15.9	8	7	70
Lowell	28	12.5	14.4	8	4	139
Lynn	15	7.5	9.6	3	1	80
Memphis	65	19.4	12.7	5	3	
Milwaukee	80	8.3	9.5	15	12	70
Minneapolis	81	9.9	10.2	7	7	37
Nashville [5]	25	9.6	12.3	2	2	
New Bedford	24	9.3	8.3	5	5	83
New Haven	32	9.3	9.5	5	8	65
New Orleans	130	17.4	15.8	17	17	

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births—an annual rate based on deaths under 1 year for the week and estimated births for 1924. Cities left blank are not in the registration area for births.
[3] Data for 66 cities.
[4] Data for 62 cities.
[5] Deaths for week ended Friday, Sept. 25, 1925.

Deaths from all causes in certain large cities of the United States during the week ended September 26, 1925, infant mortality, annual death rate, and comparison with corresponding week of 1924—Continued

City	Week ended Sept. 26, 1925		Annual death rate per 1,000 corresponding week, 1924	Deaths under 1 year		Infant mortality rate week ended Sept. 26, 1925
	Total deaths	Death rate		Week ended Sept. 26, 1925	Corresponding week, 1924	
New York	1,156	9.9	9.9	166	135	67
Bronx Borough	136	7.9	7.7	20	10	69
Brooklyn Borough	363	8.5	9.0	46	55	47
Manhattan Borough	509	11.8	11.2	77	60	80
Queens Borough	100	9.1	10.0	19	7	88
Richmond Borough	48	18.7	14.8	4	3	72
Newark, N. J	91	10.5	10.4	15	17	68
Norfolk	34			5	4	92
Oakland	39	8.0	11.2	3	1	35
Oklahoma City	36			3	3	
Omaha	51	12.6	17.0	9	7	93
Paterson	28	10.3	9.3	1	3	17
Philadelphia	395	10.4	11.0	69	54	87
Pittsburgh	160	13.2	11.8	40	16	133
Portland, Oreg	53	9.8	10.1	4	3	40
Providence	46	9.8	11.3	4	7	32
Richmond	43	12.0	12.5	14	5	167
Rochester	59	9.3	8.7	6	6	48
St. Louis	144	9.1	11.2	16	16	
St. Paul	44	9.3	11.5	3	8	25
Salt Lake City [1]	28	11.1	12.2	3	4	47
San Antonio	48	12.6	11.2	11	10	
San Diego	28	13.8	15.7	0	3	0
San Francisco	140	13.1	12.3	7	5	40
Schenectady	12	6.1	7.8	3	1	84
Seattle	64			3	7	29
Somerville	16	8.2	7.8	2	2	54
Spokane	24	11.5	11.5	5	2	112
Springfield, Mass	26	8.9	11.9	3	1	45
Syracuse	38	10.3	10.8	9	3	113
Tacoma	28	14.0	7.6	1	0	23
Toledo	60	10.9	11.7	11	5	99
Trenton	31	12.2	12.5	3	6	49
Utica	35	17.0		6		129
Washington, D. C	134	14.0	11.7	29	15	163
Waterbury	26			5	4	108
Wilmington, Del	27	11.5	12.6	6	3	136
Worcester	45	11.8	7.5	8	3	92
Yonkers	9	4.2	5.2	0	2	0
Youngstown	33	10.8	8.7	9	7	111

[1] Deaths for week ended Friday, Sept. 25, 1925.

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 October 3, 1925

ALABAMA

	Cases
Chicken pox	6
Dengue	5
Diphtheria	41
Influenza	1
Malaria	143
Measles	3
Mumps	14
Pellagra	20
Pneumonia	9
Scarlet fever	22
Smallpox	1
Trachoma	4
Tuberculosis	62
Typhoid fever	61
Whooping cough	24

ARIZONA

Diphtheria	2
Measles	2
Mumps	1
Tuberculosis	6
Typhoid fever	7
Whooping cough	20

ARKANSAS

Chicken pox	3
Diphtheria	4
Hookworm disease	12
Influenza	18
Malaria	142
Measles	1
Mumps	4
Pellagra	11
Scarlet fever	3
Trachoma	3
Tuberculosis	21
Typhoid fever	44
Whooping cough	3

CALIFORNIA

Cerebrospinal meningitis:	Cases
Sacramento	1
San Fernando	1
Diphtheria	77
Influenza	5
Measles	17
Poliomyelitis:	
Berkeley	1
Fresno	1
Los Angeles	1
Los Angeles County	2
Orange County	1
San Francisco	2
Stanislaus County	1
Scarlet fever	54
Smallpox	13
Typhoid fever	16

COLORADO

(Exclusive of Denver)

Chicken pox	10
Diphtheria	27
Measles	4
Mumps	4
Paratyphoid fever	1
Pneumonia	2
Scarlet fever	13
Smallpox	1
Tuberculosis	54
Typhoid fever	24
Whooping cough	13

CONNECTICUT

Cerebrospinal meningitis	2
Chicken pox	2
Diphtheria	18
German measles	1
Influenza	3

CONNECTICUT—continued

	Cases
Measles	22
Pneumonia (broncho)	11
Pneumonia (lobar)	15
Poliomyelitis	2
Scarlet fever	27
Septic sore throat	1
Trichinosis	2
Tuberculosis (all forms)	23
Typhoid fever	13
Whooping cough	69

DELAWARE

Diphtheria	2
Mumps	1
Pneumonia	1
Scarlet fever	1
Tuberculosis	3
Typhoid fever	1

FLORIDA

Chicken pox	1
Dengue	1
Diphtheria	28
Malaria	8
Pneumonia	3
Tuberculosis	11
Typhoid fever	14
Whooping cough	1

GEORGIA

Anchylostomiasis	2
Cerebrospinal meningitis	1
Chicken pox	7
Conjunctivitis (infectious)	3
Diphtheria	20
Dysentery	13
Influenza	6
Malaria	72
Mumps	15
Paratyphoid fever	3
Pellagra	6
Pneumonia	17
Poliomyelitis	1
Scarlet fever	7
Septic sore throat	10
Smallpox	1
Tuberculosis	26
Typhoid fever	62
Typhus fever	1
Whooping cough	13

ILLINOIS

Diphtheria:	
Cook County	50
Sangamon County	6
Scattering	22
Influenza	24
Lethargic encephalitis—Winnebago County	1
Measles	35
Pneumonia	106
Poliomyelitis:	
Champaign County	1
Cook County	4
Edgar County	1
Fulton County	3
Hancock County	1

ILLINOIS—continued

Poliomyelitis—Continued	Cases
Henry County	2
Iroquois County	1
Jackson County	1
Livingston County	3
Peoria County	1
Pike County	1
St. Clair County	1
Winnebago County	1
Woodford County	1
Scarlet fever	109
Smallpox:	
Jackson County	3
Scattering	1
Tuberculosis	261
Typhoid fever:	
Cook County	12
Iroquois County	5
Pulaski County	8
Saline County	8
Scattering	31
Whooping cough	113

INDIANA

Chicken pox	6
Diphtheria	52
Influenza	10
Measles	8
Pneumonia	4
Poliomyelitis	5
Scarlet fever	84
Smallpox	9
Tuberculosis	28
Typhoid fever	50
Whooping cough	42

IOWA

Cerebrospinal meningitis	3
Chicken pox	10
Diphtheria	52
Measles	5
Mumps	1
Pneumonia	1
Poliomyelitis	16
Scarlet fever	27
Smallpox	4
Tuberculosis	1
Typhoid fever	11
Whooping cough	7

KANSAS

Cerebrospinal meningitis:	
Cheney	1
Emporia	1
Scandia	1
Tonganoxie	1
Chicken pox	19
Diphtheria	17
Enteritis	4
German measles	1
Influenza	1
Measles	3
Mumps	5
Pneumonia	7

KANSAS—continued

Poliomyelitis:	Cases
Arrington	1
Corning	1
Ellsworth	1
Harris	1
Kansas City	1
Marion	1
Montrose	1
Newell	1
Salina	1
Topeka (rural)	1
Wichita	2
Winfield	1
Scarlet fever	40
Tetanus	1
Tuberculosis	71
Typhoid fever	51
Vincent's angina	1
Whooping cough	38

LOUISIANA

Diphtheria	22
Influenza	14
Lethargic encephalitis	1
Malaria	46
Pneumonia	50
Scarlet fever	4
Smallpox	4
Tuberculosis	55
Typhoid fever	34

MAINE

Cerebrospinal meningitis	1
Chicken pox	13
Diphtheria	2
Dysentery	4
German measles	6
Measles	1
Mumps	2
Paratyphoid fever	1
Pneumonia	3
Poliomyelitis	1
Scarlet fever	10
Tuberculosis	4
Typhoid fever	27
Vincent's angina	1
Whooping cough	11

MARYLAND [1]

Chicken pox	5
Diphtheria	53
Dysentery	11
Influenza	8
Lethargic encephalitis	3
Measles	11
Meningitis (epidemic)	1
Mumps	18
Paratyphoid fever	16
Pneumonia (broncho)	12
Pneumonia (lobar)	8
Poliomyelitis	1
Scarlet fever	32
Septic sore throat	2
Tetanus	2
Tuberculosis	53
Typhoid fever	66
Whooping cough	25

[1] Week ended Friday.

MASSACHUSETTS

	Cases
Cerebrospinal meningitis	1
Chicken pox	27
Conjunctivitis (suppurative)	10
Diphtheria	84
German measles	6
Influenza	1
Lethargic encephalitis	2
Malaria	1
Measles	130
Mumps	13
Ophthalmia neonatorum	10
Pneumonia (lobar)	28
Poliomyelitis	7
Scarlet fever	94
Septic sore throat	1
Tetanus	1
Trachoma	2
Tuberculosis (pulmonary)	81
Tuberculosis (other forms)	17
Typhoid fever	17
Whooping cough	150

MICHIGAN

Diphtheria	71
Measles	31
Pneumonia	44
Scarlet fever	106
Tuberculosis	274
Typhoid fever	64
Whooping cough	133

MINNESOTA

Cerebrospinal meningitis	1
Chicken pox	18
Diphtheria	59
Poliomyelitis	58
Scarlet fever	86
Smallpox	2
Tuberculosis	161
Typhoid fever	10
Whooping cough	10

MISSISSIPPI

Diphtheria	32
Poliomyelitis	2
Scarlet fever	13
Typhoid fever	37

MISSOURI

Chicken pox	6
Diphtheria	67
Influenza	5
Measles	3
Mumps	3
Ophthalmia neonatorum	3
Pneumonia	12
Poliomyelitis	7
Scarlet fever	6
Septic sore throat	2
Smallpox	2
Trachoma	7
Tuberculosis	82
Typhoid fever	26
Whooping cough	31

MONTANA

	Cases
Chicken pox	18
Diphtheria	3
Measles	2
Pneumonia	2
Scarlet fever	16
Smallpox	2
Tuberculosis	1
Typhoid fever	15
Whooping cough	23

NEW JERSEY

Anthrax	1
Chicken pox	9
Diphtheria	70
Influenza	7
Malaria	3
Measles	20
Pneumonia	46
Poliomyelitis	5
Scarlet fever	46
Typhoid fever	33
Whooping cough	32

NEW MEXICO

Chicken pox	2
Conjunctivitis	4
Diphtheria	3
Mumps	5
Pellagra	3
Pneumonia	2
Poliomyelitis	1
Scarlet fever	1
Tuberculosis	79
Typhoid fever	29
Whooping cough	6

NEW YORK

(Exclusive of New York City)

Cerebrospinal meningitis	1
Diphtheria	60
Influenza	44
Lethargic encephalitis	3
Measles	48
Pneumonia	88
Poliomyelitis	35
Scarlet fever	75
Typhoid fever	47
Whooping cough	175

NORTH CAROLINA

Chicken pox	5
Diphtheria	191
Lethargic encephalitis	1
Measles	1
Poliomyelitis	2
Scarlet fever	43
Septic sore throat	6
Smallpox	2
Trachoma	10
Typhoid fever	21
Whooping cough	60

[2] Deaths.

OKLAHOMA

(Exclusive of Tulsa and Oklahoma City)

	Cases
Diphtheria	23
Influenza	10
Malaria	52
Measles	1
Mumps	1
Pellagra	10
Pneumonia	3
Poliomyelitis	3
Scarlet fever	10
Smallpox	3
Typhoid fever	98
Whooping cough	11

OREGON

Chicken pox	7
Diphtheria	10
Influenza	4
Measles	3
Mumps	10
Pneumonia	[2] 4
Poliomyelitis	2
Scarlet fever	24
Smallpox	3
Tuberculosis	12
Typhoid fever	7
Whooping cough	5

SOUTH DAKOTA

Chicken pox	2
Diphtheria	8
Measles	1
Mumps	5
Pneumonia	1
Poliomyelitis	3
Scarlet fever	17
Tuberculosis	1
Typhoid fever	6
Whooping cough	2

TEXAS

Chicken pox	1
Diphtheria	7
Influenza	2
Lethargic encephalitis	1
Mumps	5
Pellagra	2
Poliomyelitis	2
Scarlet fever	2
Smallpox	1
Trachoma	2
Tuberculosis	10
Typhoid fever	15
Typhus fever	2
Whooping cough	4

VERMONT

Chicken pox	5
Mumps	50
Poliomyelitis	2
Scarlet fever	4
Whooping cough	3

WASHINGTON

	Cases
Chicken pox	30
Diphtheria	18
German measles	2
Measles	2
Mumps	11
Pneumonia	2
Poliomyelitis:	
Chelan County	1
Lewis County	1
Seattle	1
Skagit County	2
Spokane	1
Scarlet fever	24
Smallpox	10
Trachoma—Pierce County	1
Tuberculosis	46
Typhoid fever	16
Whooping cough	8

WEST VIRGINIA

Diphtheria	4
Scarlet fever	2
Typhoid fever:	
Huntington	6
Scattering	5

WISCONSIN

Milwaukee:	
Cerebrospinal meningitis	1
Chicken pox	20
Diphtheria	15
Influenza	1
Measles	3

WISCONSIN—continued

Milwaukee—Continued.	Cases
Mumps	3
Pneumonia	10
Poliomyelitis	2
Scarlet fever	11
Tuberculosis	13
Whooping cough	40
Scattering:	
Cerebrospinal meningitis	1
Chicken pox	10
Diphtheria	25
German measles	2
Influenza	21
Lethargic encephalitis	1
Measles	29
Mumps	22
Pneumonia	1
Poliomyelitis	20
Scarlet fever	55
Smallpox	2
Tuberculosis	11
Typhoid fever	14
Whooping cough	56

WYOMING

Chicken pox	1
Diphtheria	2
Scarlet fever	10
Smallpox	1
Tuberculosis	1
Typhoid fever	2
Whooping cough	2

Reports for Week Ended September 26, 1925

DISTRICT OF COLUMBIA

	Cases
Diphtheria	8
Measles	3
Pneumonia	10
Poliomyelitis	2
Scarlet fever	8
Tuberculosis	22
Typhoid fever	3
Whooping cough	33

NEBRASKA

Cerebrospinal meningitis	1
Chicken pox	1
Diphtheria	5
Mumps	1
Poliomyelitis	12
Scarlet fever	6

NEBRASKA—continued

	Cases
Smallpox	4
Tetanus	1
Typhoid fever	1
Whooping cough	14

SOUTH CAROLINA

Dengue	10
Diphtheria	61
Influenza	39
Malaria	447
Measles	8
Poliomyelitis	6
Scarlet fever	11
Tuberculosis	45
Typhoid fever	63
Whooping cough	47

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
August, 1925										
Kansas	5	35	11	5	11	2	33	91	8	171
Mississippi	0	124	246	11,727	108	848	8	40	67	737
Montana	1	13			3		15	34	13	40
North Dakota	1	11	2		8		45	76	2	6
Oregon	5	62	2		5		3	30	11	48
South Carolina		221	179	1,679	5	4	1	29	15	393
South Dakota		18			7		5	84	1	31
Virginia	4	158	678	248	111	21	17	71	7	394
West Virginia	3	57	70		21		4	84	30	294
Wyoming		6	3		2		5	23	1	9

RECIPROCAL NOTIFICATIONS, JUNE, 1925

Notifications regarding communicable diseases sent during the month of August, 1925, to other State health departments by departments of health of certain States

Referred by—	Diphtheria	Malaria	Measles	Paratyphoid	Poliomyelitis	Scarlet fever	Smallpox	Tetanus	Tuberculosis	Typhoid
Connecticut				1		1				4
Illinois		2			1		2		12	9
Massachusetts										2
Minnesota	1				1	1		1	35	2
New Jersey										2
New York	2		1	1	9	3				6
Rhode Island					3				1	

PLAGUE-ERADICATIVE MEASURES IN THE UNITED STATES

The following items were taken from the reports of plague-eradicative measures from the cities named:

Los Angeles, Calif.

Week ended Sept. 19, 1925:

Number of rats trapped	2,497
Number of rats found plague infected	0
Number of squirrels examined	832
Number of squirrels found plague infected	0
Number of mice trapped	3,538
Number of mice found plague infected	0

Date of discovery of last plague-infected rodent, Aug. 22, 1925.
Date of last human case, Jan. 15, 1925.

Oakland, Calif.

(Including other East Bay communities)

Week ended Sept. 12, 1925:

Number of rats trapped	663
Number of rats found plague infected	0

Totals:	
Number of rats trapped Jan. 1, to Sept. 12, 1925	67, 771
Number of rats found plague infected	21
Number of squirrels examined May 1 to Aug. 1, 1925	7, 277
Number of squirrels found plague infected	0
Week ended Sept. 19, 1925:	
Number of rats trapped	732
Number of rats found plague infected	0
Totals:	
Number of rats trapped Jan. 1 to Sept. 19, 1925	68, 503
Number of rats found plague infected	21

Date of discovery of last plague-infected rat, Mar. 4, 1925.
Date of last human case, Sept. 10, 1919.

New Orleans, La.

Week ended Sept. 19, 1925:	
Number of vessels inspected	29
Number of inspections made	39
Number of vessels fumigated with cyanide gas	13
Number of rodents examined for plague	2, 671
Number of rodents found plague infected	0
Totals, Dec. 5, 1924, to Sept. 19, 1925:	
Number of rodents examined for plague	171, 031
Number of rodents found plague infected	12

Date of discovery of last plague-infected rat, Jan. 17, 1925.
Date of last human case occurring in New Orleans, Aug. 20, 1920.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

Diphtheria.—For the week ended September 19, 1925, 37 States reported 1,050 cases of diphtheria. For the week ended September 20, 1924, the same States reported 1,359 cases of this disease. One hundred cities, situated in all parts of the country and having an aggregate population of more than 28,800,000, reported 535 cases of diphtheria for the week ended September 19, 1925. Last year for the corresponding week they reported 638 cases. The estimated expectancy for these cities was 715 cases. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Measles.—Thirty-four States reported 274 cases of measles for the week ended September 19, 1925, and 297 cases of this disease for the week ended September 20, 1924. One hundred cities reported 162 cases of measles for the week this year, and 90 cases last year.

Poliomyelitis.—The health officers of 38 States reported 276 cases of poliomyelitis for the week ended September 19, 1925. The same States reported 278 cases for the week ended September 20, 1924.

Scarlet fever.—Scarlet fever was reported for the week as follows: Thirty-seven States—this year, 827 cases; last year, 1,119 cases; 100 cities—this year, 342 cases; last year, 462 cases; estimated expectancy, 354 cases.

Smallpox.—For the week ended September 19, 1925, 37 States reported 117 cases of smallpox. Last year for the corresponding week

they reported 188 cases. One hundred cities reported smallpox for the week as follows: 1925, 36 cases; 1924, 86 cases; estimated expectancy, 19 cases. One death from smallpox was reported during the week at Los Angeles, Calif.

Typhoid fever.—One thousand and fifty cases of typhoid fever were reported for the week ended September 19, 1925, by 36 States. For the corresponding week of 1924 the same States reported 815 cases of this disease. One hundred cities reported 279 cases of typhoid fever for the week this year and 197 cases for the corresponding week last year. The estimated expectancy for these cities was 249 cases.

Influenza and pneumonia.—Deaths from influenza and pneumonia were reported for the week by 100 cities as follows: 1925, 357 deaths; 1924, 309 deaths.

City reports for week ended September 19, 1925

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 1915 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, 1923, 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	73,129	0	1	0	0	0	1	1	2
New Hampshire:									
Concord	22,408	0	0	1	0	0	0	0	0
Manchester	81,383	0	3	0	0	0	0	0	0
Vermont:									
Barre	[1] 10,008	0	0	0	0	0	0	0	0
Burlington	23,613	0	1	1	0	0	0	1	0
Massachusetts:									
Boston	770,400	8	33	15	0	0	4	1	16
Fall River	120,912	1	3	5	0	0	12	0	1
Springfield	144,227	1	2	0	0	0	0	0	1
Worcester	191,927	2	4	29	0	0	27	0	4
Rhode Island:									
Pawtucket	68,799	0	1	1	0	0	0	0	2
Providence	242,378	4	7	1	0	0	0	0	2
Connecticut:									
Bridgeport	[1] 143,555	0	5	4	0	0	1	0	0
Hartford	[1] 138,036	0	4	1	0	0	0	0	0
New Haven	172,967	0	3	1	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
Buffalo	536,718	0	16	3	0	1	2	0	8
New York	5,927,625	17	98	75	7	8	26	4	78
Rochester	317,867	1	3	2	0	0	4	0	4
Syracuse	184,511	0	5	0	0	0	0	3	0
New Jersey:									
Camden	124,157	0	3	3	0	0	0	0	0
Newark	438,699	4	8	10	1	0	3	1	4
Trenton	127,390	0	4	0	0	0	1	0	2

[1] Population Jan. 1, 1920.

City reports for week ended September 19, 1925—Continued

Division, State, and city	Population July 1, 1923, 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			
MIDDLE ATLANTIC—con.									
Pennsylvania:									
Philadelphia	1,922,788	7	32	47	0	2	23	0	26
Pittsburgh	613,442	0	19	21	0	-------	6	0	-------
Reading	110,917	0	2	3	0	0	2	0	0
Scranton	140,636	0	3	6	0	-------	1	0	-------
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	406,312	2	8	3	0	1	0	0	4
Cleveland	888,519	4	28	26	1	0	11	2	7
Columbus	261,082	0	4	1	0	0	0	0	2
Toledo	268,338	0	9	3	0	0	1	0	2
Indiana:									
Fort Wayne	93,573	0	2	1	0	0	0	0	0
Indianapolis	342,718	0	15	2	0	0	5	0	1
South Bend	76,709	0	1	3	0	0	0	0	0
Terre Haute	68,939	0	1	2	0	0	0	0	0
Illinois:									
Chicago	2,886,121	12	84	45	6	2	10	2	26
Springfield	61,833	3	1	1	0	0	0	2	1
Michigan:									
Detroit	995,668	2	43	13	3	3	0	1	16
Flint	117,968	0	6	0	0	0	0	0	0
Grand Rapids	145,947	0	3	0	0	0	0	0	0
Wisconsin:									
Madison	42,519	0	0	0	0	0	6	0	0
Milwaukee	484,595	7	12	9	0	0	0	2	5
Racine	64,393	0	1	2	0	0	0	0	0
Superior	[1] 39,671	0	1	1	0	0	0	0	1
WEST NORTH CENTRAL									
Minnesota:									
Duluth	106,289	3	2	1	0	0	0	0	1
Minneapolis	409,125	5	19	36	0	2	1	4	4
St. Paul	241,891	2	13	11	0	0	0	0	6
Iowa:									
Davenport	61,262	0	1	0	0	-------	0	0	-------
Sioux City	79,662	0	1	0	0	-------	0	0	-------
Waterloo	39,667	0	0	1	0	-------	0	0	-------
Missouri:									
Kansas City	351,819	0	7	2	1	1	1	1	5
St. Joseph	78,232	0	2	1	0	0	0	0	0
St. Louis	803,853	0	27	13	0	0	2	0	0
North Dakota:									
Fargo	24,841	0	1	0	0	0	0	4	0
Grand Forks	14,547	0	0	0	0	-------	0	0	-------
South Dakota:									
Aberdeen	15,829	0	0	0	0	-------	0	0	-------
Sioux Falls	29,206	1	1	1	0	0	1	1	0
Nebraska:									
Lincoln	58,761	0	1	1	0	0	0	1	2
Omaha	204,382	0	12	3	0	0	0	0	3
Kansas:									
Topeka	52,555	0	1	1	0	0	0	0	2
Wichita	79,261	0	2	2	0	0	0	0	0
SOUTH ATLANTIC									
Delaware:									
Wilmington	117,728	0	1	1	0	0	0	0	0
Maryland:									
Baltimore	773,580	4	15	7	1	0	7	6	12
Cumberland	32,361	0	1	3	2	1	0	0	1
Frederick	11,301	1	0	0	0	0	0	0	0
District of Columbia:									
Washington	[1] 437,571	1	6	4	0	0	1	0	11
Virginia:									
Lynchburg	30,277	0	0	1	0	0	0	0	0
Norfolk	159,089	1	2	0	0	0	0	0	2
Richmond	181,044	0	12	14	0	0	0	0	2
Roanoke	55,502	0	3	3	0	0	0	0	0
West Virginia:									
Charleston	45,597	0	2	3	0	0	0	0	0
Huntington	57,918	0	3	0	0	0	0	0	1
Wheeling	[1] 56,208	0	2	2	0	0	0	0	1

[1] Population Jan. 1, 1920.

City reports for week ended September 19, 1925—Continued

Division, State, and city	Population July 1, 1923, 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			
SOUTH ATLANTIC—con.									
North Carolina:									
Raleigh	29,171	0	3	1	0	0	0	0	0
Wilmington	35,719	0	2	0	0	0	0	1	1
Winston-Salem	56,230	0	3	0	0	0	0	0	0
South Carolina:									
Charleston	71,245	0	1	0	0	0	0	0	2
Columbia	39,688	0	1	0	0	0	0	0	0
Greenville	25,789	0	1	3	0	0	0	0	0
Georgia:									
Atlanta	222,963	0	6	4	7	0	0	3	6
Brunswick	15,937	0	0	0	0	0	0	0	0
Savannah	89,448	0	1	0	1	0	0	0	2
Florida:									
St. Petersburg	24,403	0	0	0	0	0	0	0	7
Tampa	56,050	0	1	0	0	0	0	0	2
EAST SOUTH CENTRAL									
Kentucky:									
Covington	57,877	0	1	0	0	1	0	0	0
Louisville	257,671	0	6	1	2	0	0	0	4
Tennessee:									
Memphis	170,067	0	7	2	0	0	0	0	4
Nashville	121,128	0	3	3	0	0	0	0	1
Alabama:									
Birmingham	195,901	0	5	5	1	0	0	0	6
Mobile	63,858	0	2	1	0	0	0	0	0
Montgomery	45,383	0	1	2	0	0	1	3	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	30,635	0	1	0	0	----	0	0	----
Little Rock	70,916	0	1	0	0	0	0	0	1
Louisiana:									
New Orleans	404,575	0	7	1	2	2	0	0	6
Shreveport	54,590	1	1	0	0	0	0	0	0
Oklahoma:									
Oklahoma	101,150	0	1	1	2	0	0	0	2
Tulsa	102,018	0	1	1	0	----	1	0	----
Texas:									
Dallas	177,274	0	4	6	0	0	1	0	4
Galveston	46,877	0	0	0	0	0	0	0	0
Houston	154,970	----	2	4	0	0	0	----	1
San Antonio	184,727	0	0	2	0	0	0	0	4
MOUNTAIN									
Montana:									
Billings	16,927	0	0	0	0	0	0	1	0
Great Falls	27,787	2	0	1	0	0	0	2	0
Helena	[1] 12,037	----	0	----	----	----	----	----	----
Missoula	[1] 12,668	0	0	0	0	0	0	0	1
Idaho:									
Boise	22,806	0	0	0	0	0	1	0	0
Colorado:									
Denver	272,031	4	9	9	0	2	0	1	8
Pueblo	43,519	----	3	10	0	0	0	----	1
Arizona:									
Phoenix	33,899	0	----	2	0	0	0	0	0
Utah:									
Salt Lake City	126,241	2	2	3	0	0	0	5	2
Nevada:									
Reno	12,429	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	[1] 315,685	6	4	9	0	----	1	3	----
Spokane	104,573	1	2	0	0	----	0	0	----
Tacoma	101,731	1	2	6	0	0	0	0	3
Oregon:									
Portland	273,621	2	4	5	0	0	0	2	3
California:									
Los Angeles	666,853	3	25	19	1	0	1	7	9
Sacramento	69,950	0	1	0	0	0	2	0	1
San Francisco	539,038	17	14	13	1	0	1	6	4

[1] Population Jan. 1, 1920.

City reports for week ended September 19, 1925—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	0	2	2	0	2	22
New Hampshire:											
Concord	0	3	0	0	0	0	0	0	0	0	4
Manchester	1	3	0	0	0	0	0	0	0	0	10
Vermont:											
Barre	1	0	0	0	0	0	0	0	0	0	4
Burlington	2	0	0	0	0	0	0	0	0	0	5
Massachusetts:											
Boston	12	7	0	0	0	9	4	3	0	37	163
Fall River	1	0	0	0	0	2	3	1	0	7	24
Springfield	2	1	0	0	0	1	0	1	0	5	25
Worcester	3	5	0	0	0	0	1	0	0	14	36
Rhode Island:											
Pawtucket	0	1	0	0	0	0	1	0	0	0	13
Providence	3	2	0	0	0	5	2	1	1	2	50
Connecticut:											
Bridgeport	1	1	0	0	0	0	1	2	0	3	18
Hartford	2	4	0	0	0	1	2	1	1	4	31
New Haven	2	0	0	0	0	0	4	1	0	19	16
MIDDLE ATLANTIC											
New York:											
Buffalo	7	5	0	0	0	4	3	1	0	6	126
New York	34	22	0	0	0	[1] 75	47	40	3	50	1,104
Rochester	3	2	0	0	0	2	2	1	0	8	72
Syracuse	4	1	0	0	0	0	2	1	0	39	35
New Jersey:											
Camden	1	2	0	0	0	0	1	1	0	4	16
Newark	4	7	0	0	0	1	2	3	0	22	59
Trenton	0	0	0	0	0	5	1	1	0	0	27
Pennsylvania:											
Philadelphia	17	28	0	0	0	35	15	13	0	73	442
Pittsburgh	12	21	0	0	-------	-------	5	8	-------	0	-------
Reading	1	4	0	0	0	3	3	1	0	13	25
Scranton	1	1	0	0	-------	-------	1	0	-------	0	-------
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	6	3	0	0	0	8	2	0	1	3	109
Cleveland	11	8	0	0	0	16	5	5	1	55	176
Columbus	4	3	0	1	0	4	1	1	0	4	70
Toledo	5	1	0	0	0	2	3	8	0	3	64
Indiana:											
Fort Wayne	1	1	0	0	0	1	1	4	0	0	14
Indianapolis	4	4	1	0	0	6	3	0	0	9	87
South Bend	2	0	1	0	0	0	1	0	0	3	14
Terre Haute	1	0	0	0	0	1	0	0	1	0	14
Illinois:											
Chicago	44	25	1	1	0	36	9	14	2	55	527
Springfield	1	0	0	0	0	0	1	1	0	0	11
Michigan:											
Detroit	30	23	2	0	0	23	5	1	1	66	269
Flint	4	4	0	1	0	1	1	0	0	24	15
Grand Rapids	3	6	1	0	0	2	1	0	0	16	29
Wisconsin:											
Madison	0	3	0	0	0	0	0	0	0	1	6
Milwaukee	14	1	1	0	0	3	0	0	0	72	-------
Racine	2	0	0	0	0	0	1	0	0	3	8
Superior	1	2	1	0	0	0	0	0	0	0	5
WEST NORTH CENTRAL											
Minnesota:											
Duluth	3	18	0	0	0	2	1	0	0	2	25
Minneapolis	10	13	0	0	0	0	1	8	0	2	71
St. Paul	5	10	1	0	0	4	2	3	1	14	60

[1] Pulmonary tuberculosis only.

City reports for week ended September 19, 1925—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—con.											
Iowa:											
Davenport	0	0	0	0	----	----	1	0	----	0	----
Sioux City	1	0	0	0	----	----	0	2	----	0	----
Waterloo	1	0	0	0	----	----	0	0	----	0	----
Missouri:											
Kansas City	3	3	0	0	0	6	3	2	0	12	92
St. Joseph	1	0	0	0	----	----	0	0	----	0	----
St. Louis	13	14	0	0	0	10	7	10	3	6	173
North Dakota:											
Fargo	1	5	0	1	0	0	0	0	0	4	5
Grand Forks	1	0	0	0	----	----	0	0	----	4	----
South Dakota:											
Aberdeen	1	2	0	0	----	----	1	0	0	----	----
Sioux Falls	1	8	0	1	0	0	0	0	0	0	6
Nebraska:											
Lincoln	1	0	0	0	0	0	0	0	0	6	12
Omaha	2	2	1	0	0	5	2	0	0	6	46
Kansas:											
Topeka	2	0	0	0	0	3	2	1	0	14	42
Wichita	1	0	0	0	0	0	2	2	0	2	25
SOUTH ATLANTIC											
Delaware:											
Wilmington	1	0	0	0	0	2	1	2	0	0	22
Maryland:											
Baltimore	6	1	0	----	----	14	12	13	1	54	198
Cumberland	0	1	0	0	0	1	1	1	0	0	10
Frederick	0	0	0	0	0	0	0	0	0	0	5
District of Columbia:											
Washington	5	6	0	0	0	11	5	7	2	18	126
Virginia:											
Lynchburg	0	2	0	0	0	0	1	3	0	0	9
Norfolk	1	0	0	0	0	1	1	3	0	1	----
Richmond	4	4	0	0	0	4	2	2	0	7	52
Roanoke	0	1	0	0	0	0	2	1	0	0	16
West Virginia:											
Charleston	1	0	0	0	0	1	2	5	1	2	14
Huntington	1	0	0	0	0	1	1	2	0	0	14
Wheeling	1	2	0	0	0	0	2	4	0	0	20
North Carolina:											
Raleigh	0	0	0	0	0	0	1	0	0	0	11
Wilmington	0	0	0	0	0	0	1	0	1	0	8
Winston-Salem	1	2	1	6	0	4	2	0	0	7	15
South Carolina:											
Charleston	0	0	0	0	0	4	2	2	0	0	23
Columbia	6	0	0	0	----	----	1	0	----	1	----
Greenville	1	0	0	0	0	0	0	2	0	1	2
Georgia:											
Atlanta	5	0	0	0	0	4	3	9	1	2	66
Brunswick	0	0	0	0	0	0	0	0	0	0	2
Savannah	0	0	1	0	0	3	1	0	1	0	29
Florida:											
St. Petersburg	0	0	0	0	0	0	0	0	1	0	7
Tampa	0	0	1	0	0	1	0	0	1	0	23
EAST SOUTH CENTRAL											
Kentucky:											
Covington	0	0	0	0	0	0	1	0	0	0	----
Louisville	2	1	0	0	0	2	5	1	1	2	55
Tennessee:											
Memphis	1	1	0	0	0	5	5	19	2	7	67
Nashville	2	1	0	2	0	1	5	11	2	0	65
Alabama:											
Birmingham	4	6	0	5	0	3	6	1	2	1	50
Mobile	0	0	0	0	0	0	0	4	1	0	22
Montgomery	0	1	0	0	0	0	1	1	0	0	20

City reports for week ended September 19, 1925—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	1	1	0	0			0	1		0	
Little Rock	1	0	0	0	0	0	2	8	1	0	
Louisiana:											
New Orleans	1	4	0	0	0	17	5	18	1	1	137
Shreveport	0	1	1	0	0	1	1	2	0	0	24
Oklahoma:											
Oklahoma	1	0	0	0	0	0	3	4	0	0	19
Tulsa	2	1	1	0			2	3		1	
Texas:											
Dallas	1	2	1	0	0	0	2	3	1	13	39
Galveston	0	0	0	0	0	0	0	2	0	0	8
Houston	0	1	0	1	0	2	1	0	0		32
San Antonio	0	0	0	0	0	6	0	2	1	0	54
MOUNTAIN											
Montana:											
Billings	1	0	0	0	0	0	0	0	0	0	4
Great Falls	1	4	0	0	0	0	1	0	0	7	5
Helena	0		0				0				
Missoula	0	0	0	0	0	0	0	2	0	0	6
Idaho:											
Boise	0	0	0	0	0	0	1	0	0	0	5
Colorado:											
Denver	3	9	1	0	0	10	6	2	0	18	77
Pueblo	1	0	0	0	0	0	1	1	1		11
Arizona:											
Phoenix		2		0	0	4		0	0	0	14
Utah:											
Salt Lake City	1	4	0	0	0	0	2	4	0	8	27
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	5
PACIFIC											
Washington:											
Seattle	5	8	1	1			2	4		7	
Spokane	4	3	1	4			1	0		5	
Tacoma	2	0	1	1	0	0	1	1	0	0	19
Oregon:											
Portland	3	3	2	0	0	0	2	2	1	1	58
California:											
Los Angeles	7	8	0	10	1	25	5	1	0	15	197
Sacramento	1	1	0	0	0	2	1	0	0	0	19
San Francisco	6	3	1	1	0	10	2	4	0	11	129

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									
Massachusetts:									
Boston	0	0	1	0	0	0	2	3	0
MIDDLE ATLANTIC									
New York:									
Buffalo	0	0	0	0	0	0	1		1
New York City	4	3	4	1	0	0	12	16	6
Rochester	0	0	0	0	0	0	0	3	1
Syracuse	0	0	0	0	1	1	1	1	0
Pennsylvania:									
Philadelphia	1	0	0	0	1	0	1	3	1
Pittsburgh	0	0	0	0	0	0	0	5	0

City reports for week ended September 19, 1925—Continued

Division, State, and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									H
Ohio:									
Cleveland	3	2	0	0	0	0	1	6	3
Illinois:									
Chicago	0	0	3	2	0	0	5	5	0
Michigan:									
Detroit	0	0	0	1	0	0	1	1	0
Wisconsin:									
Milwaukee	0	0	1	0	0	0	0	1	0
Racine	0	0	0	0	0	0	0	0	1
WEST NORTH CENTRAL									
Minnesota:									
Duluth	0	0	0	0	0	0	0	1	0
Minneapolis	0	0	0	0	0	0	1	4	0
St. Paul	0	0	0	0	0	0	1	4	0
Missouri:									
Kansas City	0	0	0	0	0	0	0	2	0
St. Joseph	0	0	0	0	0	0	0	1	0
St. Louis	0	0	0	0	0	0	1	1	0
Nebraska:									
Omaha	0	0	0	0	0	0	0	9	2
Kansas:									
Topeka	0	0	1	0	0	0	0	0	0
Wichita	0	0	0	0	0	0	0	2	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	1	0	1	0	0	0	2	1	0
North Carolina:									
Raleigh	0	0	0	0	0	1	0	0	0
South Carolina:									
Charleston	0	0	0	0	0	1	0	0	0
EAST SOUTH CENTRAL									
Alabama:									
Birmingham	0	0	0	0	0	0	0	1	1
Mobile	0	0	0	0	0	1	0	0	0
Montgomery	0	0	0	0	2	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	0	0	0	0	0	0	0	1	0
Little Rock	0	0	0	0	1	0	0	0	0
Louisiana:									
New Orleans	0	0	0	0	2	1	1	0	0
Shreveport	0	0	0	0	0	4	0	0	0
MOUNTAIN									
Colorado:									
Denver	0	0	0	0	0	0	0	1	0
PACIFIC									
Washington:									
Seattle	0	0	0	0	0	0	0	2	0
Spokane	0	0	0	0	0	0	0	1	0
Oregon:									
Portland	1	0	0	0	0	0	1	0	0
California:									
Los Angeles	0	0	0	1	0	0	-------	3	0
Sacramento	0	0	0	0	0	1	0	0	0
San Francisco	0	0	2	2	0	1	0	2	0

The following table gives the rates per hundred thousand population for 104 cities for the 10-week period ended September 19, 1925. The population figures used in computing the rates were estimated as of July 1, 1923, as this is the latest date for which estimates are available. The 104 cities reporting cases had an estimated aggregate population of nearly 29,000,000, and the 96 cities reporting deaths had more than 28,000,000 population. The number of cities included in each group and the aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, July 12 to September 19, 1925—Annual rates per 100,000 population [1]

DIPHTHERIA CASE RATES

	Week ended—									
	July 18	July 25	Aug. 1	Aug. 8	Aug. 15	Aug. 22	Aug. 29	Sept. 5	Sept. 12	Sept. 19
104 cities	79	78	[2] 78	[3] 87	80	70	[4] 75	[5] 72	[6] 95	[7] 99
New England	62	62	62	82	92	52	42	45	77	144
Middle Atlantic	97	91	92	83	78	73	63	62	89	[7] 81
East North Central	73	68	74	101	72	55	72	61	75	81
West North Central	85	106	100	107	113	102	118	102	[6] 148	149
South Atlantic	26	45	[2] 50	55	73	63	[4] 72	112	127	94
East South Central	11	11	11	29	34	63	40	34	80	80
West South Central	28	70	46	23	51	60	97	32	125	60
Mountain	124	115	153	[3] 68	162	76	172	315	200	224
Pacific	99	104	67	148	84	104	110	[5] 80	78	136

MEASLES CASE RATES

104 cities	159	105	[2] 73	[3] 53	48	31	[4] 28	[5] 22	[6] 23	[7] 30
New England	261	216	186	132	129	97	89	52	94	112
Middle Atlantic	199	128	77	69	57	38	34	25	25	[7] 34
East North Central	191	119	72	47	37	19	22	21	17	24
West North Central	29	19	29	11	30	6	4	6	[6] 4	10
South Atlantic	148	95	[2] 71	45	43	35	[4] 25	24	23	16
East South Central	80	63	29	11	17	6	11	0	0	6
West South Central	0	5	0	0	9	9	0	0	5	5
Mountain	29	38	105	[3] 20	19	29	29	0	10	10
Pacific	64	20	35	29	20	12	6	[5] 28	9	15

SCARLET FEVER CASE RATES

104 cities	61	57	[2] 56	[3] 53	59	53	[4] 46	[5] 56	[6] 53	[7] 63
New England	80	72	75	102	84	92	70	47	65	62
Middle Atlantic	45	43	37	33	36	23	27	30	31	[7] 45
East North Central	67	67	64	[3] 52	58	58	48	62	61	62
West North Central	108	122	124	120	137	147	112	125	[6] 114	151
South Atlantic	47	16	[2] 35	22	41	43	[4] 41	59	57	39
East South Central	80	29	63	63	40	34	29	143	120	57
West South Central	23	32	31	56	70	51	19	37	32	42
Mountain	86	162	86	[3] 39	95	67	29	76	29	166
Pacific	61	46	49	64	87	44	70	[5] 52	38	67

[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, 1923.
[2] Tampa, Fla., not included. Report not received at time of going to press.
[3] Helena, Mont., not included.
[4] Greenville, S. C., not included.
[5] Spokane, Wash., not included.
[6] Topeka, Kans., not included.
[7] Newark, N. J., not included.

Summary of weekly reports from cities, July 12 to September 19, 1925—Annual rates per 100,000 population—Continued

SMALLPOX CASE RATES

	Week ended—									
	July 18	July 25	Aug. 1	Aug. 8	Aug. 15	Aug. 22	Aug. 29	Sept. 5	Sept. 12	Sept. 19
104 cities	15	10	[2] 10	[3] 9	7	6	[4] 8	[5] 5	[6] 6	[7] 7
New England	2	5	0	0	0	0	0	0	0	0
Middle Atlantic	1	0	0	0	0	0	1	0	0	[7] 0
East North Central	10	8	4	6	3	2	8	5	2	2
West North Central	17	12	15	9	11	6	4	4	[6] 4	4
South Atlantic	8	16	[2] 2	2	2	4	[4] 12	2	12	12
East South Central	46	40	23	51	23	40	57	11	23	40
West South Central	14	5	5	14	9	5	14	5	5	5
Mountain	19	0	57	[3] 20	10	10	10	10	19	0
Pacific	119	67	84	67	67	44	29	[5] 40	44	49

TYPHOID FEVER CASE RATES

104 cities	38	34	[2] 41	[3] 41	48	57	[4] 47	[5] 40	[6] 42	[7] 51
New England	32	22	22	27	40	32	27	30	35	30
Middle Atlantic	25	21	30	23	33	45	30	29	27	[7] 35
East North Central	12	8	10	21	19	31	28	19	22	19
West North Central	44	39	48	43	58	48	35	21	[6] 61	58
South Atlantic	55	53	[2] 66	59	91	110	[4] 94	61	51	110
East South Central	223	177	183	274	217	183	177	183	246	212
West South Central	134	172	178	130	102	134	111	176	74	167
Mountain	19	48	57	[3] 107	105	105	115	29	115	88
Pacific	32	29	46	17	44	64	55	[5] 31	29	29

INFLUENZA DEATH RATES

96 cities	2	2	[2] 1	[3] 3	2	2	[4] 4	3	[6] 4	[7] 5
New England	0	0	0	5	0	0	0	0	2	0
Middle Atlantic	2	3	1	2	2	2	3	3	3	[7] 6
East North Central	3	1	0	3	3	1	4	3	7	4
West North Central	0	4	0	0	0	0	2	2	[6] 0	7
South Atlantic	4	4	[2] 2	6	0	0	2	2	0	2
East South Central	0	6	0	6	6	11	6	0	6	6
West South Central	10	0	0	5	0	10	15	5	5	10
Mountain	0	10	0	[3] 0	10	10	[3] 10	19	29	20
Pacific	4	0	0	0	0	8	0	0	4	0

PNEUMONIA DEATH RATES

96 cities	57	50	[2] 61	[3] 56	63	55	[3] 64	73	[6] 63	[7] 63
New England	50	52	55	37	30	40	42	55	52	70
Middle Atlantic	63	52	65	65	73	65	65	84	68	[7] 62
East North Central	47	40	52	38	51	43	54	64	49	47
West North Central	55	42	42	53	44	31	53	33	[6] 38	46
South Atlantic	51	55	[2] 63	73	81	63	84	57	64	85
East South Central	74	63	74	69	63	80	69	143	154	86
West South Central	76	66	111	71	87	82	112	76	87	82
Mountain	86	57	76	[3] 29	57	67	[3] 76	86	38	117
Pacific	45	65	69	78	90	53	69	106	102	69

[2] Tampa, Fla., not included. Report not received at time of going to press.
[3] Helena, Mont., not included.
[4] Greenville, S. C., not included.
[5] Spokane, Wash., not included.
[6] Topeka, Kans., not included.
[7] Newark, N. J., not included.

Number of cities included in summary of weekly reports and aggregate population of cities in each group, estimated as of July 1, 1923

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
Total	104	96	28, 842, 382	28, 084, 966
New England	12	12	2, 098, 746	2, 098, 746
Middle Atlantic	10	10	10, 304, 114	10, 304, 114
East North Central	16	16	6, 976, 567	6, 976, 567
West North Central	14	11	2, 515, 330	2, 381, 454
South Atlantic	22	22	2, 566, 901	2, 566, 901
East South Central	7	7	911, 885	911, 885
West South Central	8	6	1, 124, 564	1, 023, 013
Mountain	9	9	546, 445	546, 445
Pacific	6	3	1, 797, 830	1, 275, 841

FOREIGN AND INSULAR

THE FAR EAST

Report for week ended September 12, 1925.—The following report for the week ended September 12, 1925, was transmitted by the Far Eastern Bureau of the Health Section of the League of Nations, located at Singapore, to the headquarters at Geneva:

Port	Plague		Cholera		Smallpox		Port	Plague		Cholera		Smallpox	
	Cases	Deaths	Cases	Deaths	Cases	Deaths		Cases	Deaths	Cases	Deaths	Cases	Deaths
Calcutta	----	0	----	5	74	74	Yokohama	0	0	18	----	0	0
Bombay	----	1	----	0	3	2	Simonoseki	0	0	0	0	0	0
Madras	----	0	----	0	10	1	Moji	0	0	0	0	0	0
Rangoon	----	21	----	0	0	1	Kobe	0	0	6	----	0	0
Karachi	----	1	----	0	1	1	Osaka	0	0	0	0	0	0
Negapatam	----	0	----	1	0	0	Keelung (Formosa)	0	0	0	0	0	0
Singapore	0	0	0	0	0	0	Fou-San-Po (Korea)	0	0	0	0	0	0
Port Swettenham	0	0	0	0	0	0	Adelaide	0	0	0	0	0	0
Penang	0	0	0	0	0	0	Brisbane	0	0	0	0	0	0
Batavia	0	0	0	0	0	0	Fremantle	0	0	0	0	0	0
Soerabaya	0	0	0	0	1	0	Melbourne	0	0	0	0	0	0
Samarang	0	0	0	0	0	0	Sydney	0	0	0	0	0	0
Belawan Deli	0	0	0	0	5	4	Suez	0	0	0	0	0	0
Macassar	0	0	0	0	0	0	Alexandria	1	0	0	0	0	0
Sandakan (North Borneo)	0	0	0	0	0	0	Port Said	0	0	0	0	0	0
Kuching (Sarawak)	0	0	0	0	2	0	Mombasa (Kenya)	0	0	0	0	0	0
Bangkok	0	0	0	0	0	0	Massaua (Eritrea)	0	0	0	0	0	0
Saigon and Cholon	0	1	0	0	0	0	Djibuti	0	0	0	0	0	0
Hongkong	0	0	0	0	0	0	Lourenco Marques	0	0	0	0	0	0
Shanghai	0	0	12	19	0	0	Durban	0	0	0	0	0	0
Manila	0	0	0	0	0	0	Cape Town	0	0	0	0	0	0
Colombo	0	0	0	0	0	0	Mauritius	0	0	0	0	0	0
Nagasaki	0	0	0	0	0	0	Seychelles	0	0	0	0	0	0

CANADA

Communicable diseases—Ontario—August, 1925 (comparative).—Communicable diseases were reported in the Province of Ontario, Canada, for the month of August, 1925, as follows:

Disease	August, 1925		August, 1924		Disease	August, 1925		August, 1924	
	Cases	Deaths	Cases	Deaths		Cases	Deaths	Cases	Deaths
Cerebrospinal meningitis	4	1	9	5	Pneumonia	----	37	----	45
Chancroid	1	----	1	----	Poliomyelitis	19	----	3	----
Chicken pox	133	----	133	----	Scarlet fever	141	2	337	7
Diphtheria	244	10	269	16	Septic sore throat	----	----	3	----
German measles	4	----	15	----	Smallpox	7	----	6	----
Gonorrhea	112	----	175	----	Syphilis	112	----	121	----
Influenza	2	2	18	3	Tuberculosis	133	44	156	74
Lethargic encephalitis	4	2	1	1	Typhoid fever	111	5	120	8
Measles	164	----	879	3	Whooping cough	305	10	300	4
Mumps	43	----	180	----					

CHINA

Cholera—Shanghai.—Under date of August 22, 1925, cholera was reported prevalent at Shanghai, China, with an estimated number of about 100 new cases occurring daily in a population of about 1,250,000, The case mortality was stated to be approximately 60 per cent.

JAPAN

Cholera—Kawasaki, Tokyo, and Yokohama.—Information dated September 10, 1925, reports to that date the following number of authentic cases of cholera: Kawasaki, 1 case; Tokyo, 9 cases; Yokohama, 24 cases; and, according to press reports, the disease appeared to be spreading throughout the Kwanto and Kwansai districts.

The Japanese health authorities were stated to be handling the situation efficiently by means of examinations, vaccination, quarantine, and publicity through periodicals and posters. The water supplies of the various large cities had not been implicated.

Special measures as required by the United States quarantine regulations were being taken by service officers with regard to passengers on vessels sailing for United States ports.

Press reports state that, at Kobe, a Chinese steerage passenger suffering from cholera was taken from the steamship *President Lincoln* from Shanghai en route to Yokohama, Honolulu, and San Francisco, and that the vessel was held at pier for examination of all steerage passengers.

LITHUANIA

Smallpox—Typhoid fever—Typhus fever—January 1–June 30, 1925.—During the six-month period ended June 30, 1925, 4 cases of smallpox, 252 cases of typhoid fever (8 deaths), and 189 cases of typhus fever (10 deaths) were reported in Lithuania.

Scarlet fever, epidemic.—During the spring months of the period under report epidemic scarlet fever, with 665 cases, was reported in Lithuania. At Kovno, August 27, 1925, many cases were reported present.

Vaccination against smallpox and rabies.—At the Institute of Hygiene during the same period 53,500 vaccinations against smallpox and 160 against rabies were reported.

MADAGASCAR

Plague—July 16–31, 1925.—During the 16-day period ended July 31, 1925, 10 cases of plague, with 10 deaths, were reported in the island of Madagascar. The occurrence was in the Province of Tananarive. The cases were distributed according to type as follows: Pneumonic, 6 cases; septicemic, 4 cases.

MALTA

Lethargic encephalitis—Malta fever—Typhoid fever—August, 1925.—During the month of August, 1925, 2 cases of lethargic encephalitis, 90 cases of Malta (undulant) fever, and 27 cases of typhoid fever were reported in the island of Malta. Population, 223,088.

SPAIN

Mortality—Seville—Year 1924.—During the year 1924 a total of 5,278 deaths was reported at Seville, Spain, the largest number of deaths, viz, 474 and 565, respectively, being reported in the months of January and June. Tuberculosis and meningitis were stated to have been the chief causes of deaths, with 711 and 369 deaths, respectively, during the period under report. Population, 205,529.

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 October 9, 1925[1]

CHOLERA

Place	Date	Cases	Deaths	Remarks
China:				
Shanghai				Aug. 22, 1925: Prevalent with 100 new cases (estimated) daily.
India				July 19–25, 1925: Cases, 2,013; deaths, 1,110.
Bombay	Aug. 9–15	1		
Calcutta	Aug. 16–22	8	7	
Madras	Aug. 23–29	4		
Rangoon	Aug. 9–15	1	1	
Japan				Sept. 10, 1925: Spreading throughout Kwanto and Kwansai districts.
Kawasaki	Sept. 10	1		
Tokyo	do	9		
Yokohama	do	24		
On vessel:				
———		1		At Nagasaki. Reported Sept. 2, 1925, arrived on vessel from China.

PLAGUE

India				July 19–25, 1925: Cases, 204; deaths, 143.
Bombay	Aug. 9–15	3	2	
Madras Presidency	Aug. 2–8	18	6	
Rangoon	Aug. 9–15	28	23	
Java:				
Batavia	Aug. 8–14	28	26	Batavia Province.
Socrabaya	July 26–Aug. 1	2	2	
Madagascar				July 16–31, 1925: Cases, 10; deaths, 10.
Tananarive Province	July 16–31	10	10	Pneumonic, 6; septicemic, 4.
On vessel:				
S. S. City of Norwich	Apr. 15	1		At Port Said, Egypt, Apr. 14, 1925, from Rangoon, Colombo, and Perim; destination, London. Case occurred in first officer of vessel.

[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 October 9, 1925—Continued

SMALLPOX

Place	Date	Cases	Deaths	Remarks
Canada:				
Ontario				Aug. 1–31, 1925: Cases, 7; corresponding period 1924, cases, 6
China:				
Nanking	Aug. 23–29			Prevalent.
Swatow	Aug. 16–22			Endemic.
Egypt				January–June, 1925: Cases, 341; deaths, 74.
Great Britain:				
England and Wales	Aug. 30–Sept. 5	32		
Newcastle-on-Tyne	Sept. 6–12	1		
India				July 19–25, 1925: Cases, 2,403; deaths, 515.
Bombay	Aug. 9–15	1		
Calcutta	Aug. 16–22	4	4	
Madras	Aug. 23–29	10	5	
Rangoon	Aug. 9–15	2		
Indo-China:				
Saigon	Aug. 17–23	1	1	Including 100 square kilometers of surrounding country.
Italy:				
Turin	Aug. 31–Sept. 6	2		
Java:				
Batavia	Aug. 8–14	4		Province.
Soerabaya	July 26–Aug. 1	97	11	
Mexico				January–May, 1925: Deaths, 2,160.
Guadalajara	Sept. 15–21		1	
Mexico City	Aug. 30–Sept. 5	1		Including municipalities in Federal District.
San Luis Potosi	Sept. 13–19		1	
Torreon	Aug. 1–31	2	2	
Spain:				
Malaga	Aug. 30–Sept. 12		8	

TYPHUS FEVER

Place	Date	Cases	Deaths	Remarks
Great Britain:				
Scotland—				
Glasgow	Sept. 6–12	1		
Greenock	May		2	
Egypt				January–June, 1925: Cases, 1,011; deaths, 211.
Mexico				January–May, 1925: Deaths, 108.
Mexico City	Aug. 30–Sept. 5	12		Including municipalities in Federal District.

Reports Received from June 27 to October 2, 1925 [1]

CHOLERA

Place	Date	Cases	Deaths	Remarks
Algeria:				
Algiers	May 11–20	1		
Ceylon				Jan. 25–June 27, 1925: Cases, 172; deaths, 120
Do				June 28–July 11, 1925: Cases, 19; deaths, 15.
Colombo	May 10–16	2	2	
China:				
Shanghai	July 26–Aug. 15	82	39	
India				Apr. 26–June 27, 1925: Cases 33,647; deaths, 19,950. June 28–July 18, 1925: Cases, 5,468; deaths, 3,197.
Bombay	May 10–June 27	2	1	
Do	June 28–Aug. 8	10	7	
Calcutta	May 3–9	58	49	
Do	May 17–23	79	61	
Do	June 14–20	12	11	
Do	July 5–Aug. 15	56	44	
Madras Presidency	June 6–20	4	1	
Do	July 5–Aug. 22	17	10	
Rangoon	May 3–June 6	22	15	Feb. 8–14, 1925: Cases, 2; deaths, 2. (Received out of date.)
Do	June 14–27	12	8	
Do	June 28–Aug. 8	4	5	

[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 from June 27 to October 2, 1925—Continued

CHOLERA—Continued

Place	Date	Cases	Deaths	Remarks
Indo-China:				
Saigon	May 4-June 7	4	3	Including 100 square kilometers of surrounding country.
Do	June 22-July 12	3	2	
Do	Aug. 3-9	1	1	Do.
Japan:				
Kobe	Sept. 4-6	5	2	
Yokohama	Sept. 2	5	3	
Philippine Islands:				
Albay—				
Tabaco	June 14-20	1	1	
Bulacan	do	1	1	
Do	June 28-July 18	3	2	
Camarines Sur	July 3-9	1		
Lagonoy	June 6-12	2	1	
Leyte	July 8-14	1	1	
Manila	June 15-28	3		
Do	June 29-Aug. 16	17	4	June 1-Aug. 8, 1925: Cases, 17.
Mountain Province	June 23-29	1	1	
Rizal Province	Aug. 2-8	2		
Siam:				
Bangkok	Apr. 29-June 27	9	4	
Turkey:				
Constantinople	May 16-22	1		

PLAGUE

Brazil:				
Bahia	May 3-June 13	5	4	
British East Africa:				
Uganda	Feb. 1-28	28	28	
Entebbe	May 4-June 4	78	73	Apr. 1-May 31, 1925: Cases, 129; deaths, 118.
Ceylon:				
Colombo	May 10-June 30	11	10	
Do	June 28-July 25	9	7	
Do	Aug. 2-15	2	2	
China:				
Foochow	May 24-31			Reported present in epidemic form.
Nanking	July 25-Aug. 22			Present.
North Manchuria	May 27	2	1	
Ecuador:				
Guayaquil	June 1-15	1	1	May 16-June 30, 1925: Rats examined, 30,347; found infected, 95. July 1-Aug. 15, 1925: Rats taken, 31,366; rats found infected, 107.
Egypt				Jan. 1-Aug. 19, 1925: Cases, 98. Corresponding period year 1914: Cases, 347.
City—				
Alexandria	June 17-24	2	2	Bubonic.
Port Said	June 17-Aug. 6	8	3	
Do	July 30-Aug. 16	3	1	
Suez	June 14-27	3	2	
Do	Aug. 19	1	1	Septicemic.
Province—				
Assiout	June 5	1	1	
Beni-Souef	June 10-16	8	4	
Do	Aug. 6-12	5	2	
Charkieh	June 6-8	1	1	
Kena	June 17	1	1	
Minia	June 6-17	3	2	
France:				
Marseille	Aug. 13-18	3		
Gold Coast	March-April	3	3	
Greece:				
Athens	July 1-Aug. 14	26		
Piræus	July 18-Aug. 14	9		

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

Reports Received from June 27 to October 2, 1925—Continued

PLAGUE—Continued

Place	Date	Cases	Deaths	Remarks
Hawaii Territory:				
Honokaa	June 28			Plague-infected rat.
Do	Aug. 7	1		
Do	Aug. 15			Plague-infected rat, near Paauilo
Kukuhaele	July 31			Plague-infected rat.
Paauhau	Aug. 12			Do.
India				
Bombay	Apr. 26-June 27	65	59	Apr. 26-June 27, 1925: Cases: 10,166; deaths, 8,913. June 28-July 18, 1925: Cases, 614; deaths, 445.
Do	June 28-Aug. 25	13	9	
Calcutta	May 30-June 6	1	1	
Do	July 5-11	1	1	
Karachi	May 18-June 6	4	3	
Do	July 31-Aug. 6	1	1	
Madras	May 10-June 27	15	8	
Do	June 28-Aug. 1	20	7	
Rangoon	May 3-June 27	113	95	Feb. 8-14, 1925: Cases, 13; deaths, 13. (Received out of date.)
Do	June 28-July 4	20	18	
Do	July 12-Aug. 8	85	72	
Indo-China:				
Cochin-China—				
Saigon	Apr. 20-June 21	3	3	Including 100 square kilometers of surrounding country.
Iraq:				
Bagdad	May 24-June 6	9		
Do	June 21-27	5	1	
Java:				
Batavia	May 6-June 19	32	31	
Do	July 5-31	65	65	In Province.
Cheribon	Apr. 1-June 13		78	
Do	July 11-17	1	1	
Pasoeroean Residency	Mar. 7-May 25			Epidemic in several localities.
Do	July 13			Do.
Pekalongan	Apr. 9-June 13		86	
Soerabaya	May 7-27	3	3	
Do	June 28-July 4	16	1	
Soerakarta Residency	May 28			Epidemic at Kalidgambe.
Tegal	Apr. 2-May 16		36	
Do	May 24-June 13		16	
Madagascar:				
Province—				
Itasy	Apr. 1-15	1	1	
Do	July 1-15	4	4	Bubonic, 3; septicemic, 1.
Tananarive	Apr. 1-June 30	232	200	
Do	July 1-15	9	9	Bubonic, 5; pneumonic, 2; septicemic, 2.
Town—				
Tamatave (port)	Apr. 1-15	2		
Do	June 1-7		1	
Tananarive Town	Apr. 16-May 31	5	5	
Mauritius				April, 1925: One case.
Nigeria	December, 1924	17	13	
Do	January, 1925	10	6	
Do	March-May	25	18	
Peru:				
Callao	July, 1925			Present. Press reports.
Cañete	August, 1925			Do.
Lima	Aug. 14	14		Press reports.
Russia:				
Kalmyk District	May 19-31	10	8	
North Caucasus	June 6-7	2	2	
Urts	May 25-June 3	2	2	In laboratory worker and contact. Locality, Province of Bukeevsk.
Siam:				
Bangkok	Apr. 26-June 20	13	11	
Do	June 28-Aug. 8	4	4	
Straits Settlements:				
Singapore	May 3-30	9	9	
Do	June 28-July 18	2	2	
Tunis:				
Tunis	Aug. 12-18			Plague rodent.
Turkey:				
Constantinople	May 25-31	1		

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

Reports Received from June 27 to October 2, 1925—Continued

PLAGUE—Continued

Place	Date	Cases	Deaths	Remarks
Union of South Africa:				
Cape Province—				
Kimberley	June 14-20	1	1	In a Malay camp.
Do				One plague-infected house mouse.
Orange Free State—				
Boshof District	June 28-Aug. 8	3	2	Natives.
On vessel:				
Steamship Efstratios Cavoundis.	July 7-11	4	1	At Alexandria, Egypt Vessel arrived July 7, 1925. Regular route, ports in Syria, Greece, and Port Said. Dead rats reported found on board.
Steamship Arcadia	July 24-27	2		At Piræus, Greece, from Alexandria, Egypt.
Steamship Anatolia	Aug. 8	1		Do.

SMALLPOX

Algeria:				
Algiers	May 1-June 30	43	2	
Do	July 1-Aug. 20	67		
Constantine	do	47		
Brazil:				
Bahia	June 28-Aug. 22	7	6	
Pernambuco	Apr. 26-May 30	40	21	
Do	June 7-27	5	3	
Do	July 5-18	1	1	
Porto Alegre	June 14-20		1	
Do	Aug. 9-15		1	
Rio de Janeiro	May 9-June 27	5	1	
Do	June 28-Aug. 15	122	36	
British East Africa:				
Kenya—				
Mombasa	Apr. 19-June 20	27	13	
Do	July 5-Aug. 8	56	9	
Nairobi	May 3-9	3	2	
Tanganyika Territory	Apr. 5-May 23	82	24	
Do	June 14-27	48	3	
Uganda	Feb. 1-28	2		
British South Africa:				
Northern Rhodesia	Apr. 28-May 4	3		
Southern Rhodesia	June 11-July 1	2		
Bulgaria:				
Sofia	Aug. 6-19	2		
Canada:				
Alberta—				
Calgary	Aug. 2-8	1		From Crossfield, Alberta.
British Columbia—				
Vancouver	June 1-28	7		
Do	July 6-Sept. 13	15	1	
New Brunswick—				
Restigouche County	June 1-30	1		
Ontario				May 31-July 25, 1925: Cases, 20; deaths, 1. Corresponding period, 1924: Cases, 24.
Galt	June 14-20	2		
Kingston	do	1		
Do	Aug. 23-29	1		
North Bay	June 28-July 18	3		
Quebec—				
Quebec	July 26-Aug. 1	2	2	
Saskatchewan—				
Regina	May 24-30	3		
China:				
Amoy	May 17-June 30		7	
Do	July 12-Aug. 8			Present.
Antung	May 11-June 27	7		
Do	June 28-Aug. 9	3		
Canton	May 10-June 13			Do.
Chungking	May 3-30			Widespread.
Foochow	May 9-Aug. 15			Present.
Hongkong	Apr. 19-June 13	15	12	
Do	July 19-25	1		

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

Reports Received from June 27 to October 2, 1925—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
China—Continued.				
Manchuria—				
Dairen	Apr. 13–June 28	115	17	
Do	June 28–July 26	4	2	
Harbin	May 13–June 2	2		
Nanking	May 9–Aug. 15			Present.
Shanghai	May 3–June 6	5	2	
Do	July 6–25	1	1	
Swatow	May 17–Aug. 15			Stated to be endemic.
Tientsin	May 9–June 6	3		
Do	July 12–18	1		
Chosen	January–April	1,067	243	
Seoul	May 1–June 30	2		
Egypt:				
Alexandria	May 21–27	1	1	
Cairo	Mar. 19–May 13	5		
Do	June 18–24	17	5	
France				February–June, 1925: Cases, 102.
Paris	May 21–31	1		
Germany:				
Baden (State)	July 12–25	2	1	
Stuttgart	July 5–11	3	1	
Gold Coast				January–May, 1925: Cases, 379; deaths, 29.
Great Britain:				
England and Wales				May 24–June 27, 1925: Cases, 441. June 28–Aug. 29, 1925: Cases, 537.
Birmingham	July 7–13	1		
Cardiff	June 14–20	1		
Do	Aug. 2–8	14	8	
Newcastle-on-Tyne	May 31–June 27	4		
Do	June 28–Sept. 5	9	1	
Greece				January–June, 1925: Cases, 47; deaths, 8.
Athens	May 1–31		2	
Do	June 24–30	27	3	
Do	July 1–31	14	1	
Haiti:				
Port au Prince	Aug. 23–29	1		Reported at Jean Rabel Aug. 27.
Hungary:				
Budapest	July 5–18	13		
India				Apr. 26–June 27, 1925: Cases, 37,107; deaths, 9,152. June 28–July 18, 1925: Cases, 7,430; deaths, 2,002.
Bombay	Apr. 26–June 27	156	115	
Do	June 28–July 4	15	10	
Do	July 19–Aug. 8	9	7	
Calcutta	May 3–9	109	100	
Do	May 17–23	75	61	
Do	May 31–June 20	88	81	
Do	July 5–Aug. 15	54	43	
Karachi	May 18–June 27	6	1	
Do	June 28–July 4	1	1	
Madras	May 18–June 27	152	66	
Do	June 28–July 18	68	25	
Do	Aug. 2–22	67	21	
Rangoon	May 3–June 27	207	99	
Do	June 28–July 4	2	1	
Do	July 12–Aug. 8	22	11	
Indo-China:				
Cochin-China—				
Saigon	Apr. 20–May 21	13	9	Including 100 square kilometers of surrounding country.
Irak				Jan. 11–May 30, 1925: Cases, 136; deaths, 46.
Bagdad	Apr. 26–June 20	4	1	
Italy	Dec. 28–June 27	97		
Do	June 28–July 4	9		
Catania	Aug. 17–23	1		
Syracuse Province	do	1		
Turin	Aug. 17–30	4		
Venice	July 27–Aug. 2	3		
Jamaica				Apr. 26–June 27, 1925: Cases, 110. June 28–Aug. 29, 1925: Cases 102 (reported as alastrim).
Kingston	Apr. 26–June 27	19		Reported as alastrim.
Do	June 28–Aug. 29	35		Do.

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

Reports Received from June 27 to October 2, 1925—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Japan:				
Kobe	May 24–June 27	2		
Nagasaki	May 15–21	2		
Do	July 6–19	1	1	
Taiwan	June 1–30	11		
Do	July 1–10	1		
Tokyo	June 14–20	1		
Yokohama	May 25–June 12	3		
Java:				
Batavia	May 2–June 26	2		
Do	July 4–31	5		
Brebes	Apr. 22–28	1		
Cheribon	Apr. 16–22		1	
Kediri Residency	July 14			Epidemic.
Pekalongan	Apr. 2–8	1		
Rembang Residency	Apr. 23			Epidemic at Kawedanan.
Soerabaya	Apr. 16–June 27	304	41	
Do	June 28–July 25	211	25	
South Bantam	Apr. 16–22	1		
Tegal	Mar. 29–May 2	2	1	
Latvia				May–June, 1925: Cases, 4.
Lithuania				February–May, 1925: Cases, 6.
Malta	June 1–30	9		
Do	July 1–31	5		
Mexico:				
Durango	do		11	
Do	July–August		22	
Guadalajara	June 2–29		10	
Do	June 20–Aug. 31		16	
Mexico City	May 24–June 27	12		Including municipalities in Federal district.
Do	July 5–11	3		Do.
Do	July 26–Aug. 15	7		Epidemic at El Hule and other localities.
Oaxaca, State	Aug. 14			
San Luis Potosi	Aug. 16–Sept. 12	3	1	
Tampico	June 1–10		1	
Do	July 1–31	4	2	
Morocco:				
Tangier	May 17–June 5			Present among natives.
Nigeria				December, 1924: Cases, 40; deaths, 16.
Do				January, 1925: Cases, 1,538; deaths, 132.
Persia:				
Teheran	Mar. 21–May 21		29	
Peru:				
Arequipa	June 1–30		1	
Poland				Mar. 1–June 27, 1925: Cases, 41.
Portugal:				
Lisbon	Apr. 26–June 27	36	6	
Do	June 28–Aug. 15	40	14	
Oporto	June 14–20	1		
Do	July 19–Aug. 29	7		
Rumania				January–May, 1925: Cases, 22; deaths, 1.
Russia				December, 1924: Cases, 1,000. January–March, 1925: Cases, 5,243. Later than previously published reports.
Do	April	490		
Siam:				
Bangkok	Apr. 26–June 27	27	19	
Do	June 28–July 11	2	1	
Spain:				
Malaga	May 24–June 20		15	
Do	July 5–Aug. 29		21	
Valencia	May 31–June 27	3	1	
Straits Settlements:				
Singapore	May 17–23	1		
Do	July 5–11	1	1	
Sumatra:				
Pedang	July 12–25	1		
Switzerland:				
Berne	June 7–13	1		
Lucerne	June 14–20	4		
Syria:				
Beirut	Apr. 21–30	1		

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

Reports Received from June 27 to October 2, 1925—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Tripoli				Jan. 3-April 15, 1925: Cases, 14.
Tunis:				
Tunis	May 6-June 30		46	
Do	July 1-Sept. 8		49	
Turkey:				
Constantinople	May 16-22	2		
Union of South Africa:				
Cape Province	May 24-Aug. 8			Outbreaks.
Port Elizabeth	Apr. 18-25	8	1	
Transvaal	May 3-June 6			Do.
Uruguay				December, 1924: Cases, 8.
Do				February-April, 1925: Cases, 10.

TYPHUS FEVER

Algeria:				
Algiers	May 11-20	6	2	In vicinity, 12 cases. Isolated.
Do	July 1-Aug. 20	18	8	
Constantine	July 1-10	17		District.
Do	July 21-31	7		Department.
Oran	do	8		Do.
Bulgaria				November-December, 1924: 1 case. January-June, 1925: Cases, 124; deaths, 7.
Sofia	May 28-June 3	2		
Chile:				
Iquique	Aug. 8-22		2	
Valparaiso	May 10-July 18		9	
China:				
Manchuria—				
Harbin	May 19-June 2	2		
Czechoslovakia				April, 1925: 1 case.
Egypt:				
Alexandria	May 7-June 3	3	1	
Do	July 9-15	1		
Cairo	Mar. 26-May 13	6	4	
Port Said	May 14-20	1	1	
Do	July 30-Aug. 12	4	1	
Do	Aug. 20-26	3		
Esthonia				Apr. 1-May 30, 1925: Cases, 6.
Great Britain:				
Scotland—				
Greenock	Aug. 6-18	7		
Greece				January-June, 1925: Cases, 57; deaths, 6.
Athens	May 1-31		2	
Do	July 1-31	3		
Kalamata	Apr. 1-30		2	
Patras	June 28-July 4		2	
Iraq:				
Bagdad	July 12-18	1		
Ireland:				
Cork County	Aug. 25	3		
Latvia				April-June, 1925: Cases, 26.
Libau	July 14-20	1		
Lithuania				March-May, 1925: Cases, 158; deaths, 7.
Mexico:				
Mexico City	May 24-June 6	24		Including municipalities in Federal district.
Do	June 28-Aug. 1	39		Do.
Do	Aug. 16-29	13		Do.
San Luis Potosi	June 26-July 4		1	
Tampico	Aug. 20-31	1		
Morocco				January-June, 1925: Cases, 421. Later than previously published reports.

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

Reports Received from June 27 to October 2, 1925—Continued

TYPHUS FEVER—Continued

Place	Date	Cases	Deaths	Remarks
Palestine:				
Dagania	July 21-27	1		
Ekron	do	1		
Haifa	Aug. 20	1		
Jaffa district	June 28	2		
Do	Aug. 20	1		
Jerusalem	July 29-Aug. 3	2		From Ramleh district.
Maijdal	May 26-June 8	3		
Ramleh	May 19-25	1		
Safad	June 9-15	1		
Do	July 21-27	1		
Tel Aviv	do	1		
Persia:				
Teheran	Apr. 21-May 21		1	
Peru:				
Arequipa	Apr. 1-June 30		3	
Do	July 1-31		1	
Poland				Mar. 1-Apr. 11, 1925: Cases 1,195; deaths, 74. Apr. 19-June 27, 1925: Cases, 1,001; deaths, 87.
Portugal:				
Oporto	May 31-June 6	1		
Do	July 5-11	1		
Rumania	January-May	1,360	152	
Constantza	May 1-June 30	2		
Russia				December, 1924: Cases, 5,062. January-March, 1925: Cases, 24,595. Later than previously published reports.
Do	April	5,512		
Spain:				
Seville	Aug. 20-26		1	
Valencia	June 7-13		1	
Tunis:				
Tunis	May 21-June 17	16	8	
Do	July 8-Sept. 8	12	5	
Turkey:				
Constantinople	May 11-31	7	2	
Union of South Africa				June, 1925: Cases, 61; deaths, 4.
Cape Province	Apr. 19-July 25	39	5	June, 1925: Cases, 26; deaths, 1.
Natal	May 3-July 11	14		June, 1925: Cases, 2.
Durban	Feb. 1-July 4	18		
Orange Free State	Feb. 1-June 27	26	4	June, 1925: Cases, 27; deaths, 1.
Hoopstad	July 5-11			Outbreaks.
Transvaal	do	11	2	June, 1925: Cases, 6; deaths, 2.
Johannesburg	July 19-25	1		
Yugoslavia:				
Belgrade	June 8-14	1		
Zagreb	May 8-21	7	1	

YELLOW FEVER

Gold Coast	Apr. 1-30	1		
Ivory Coast:				
Lahou	June 1-10	1	1	
Liberia:				
Monrovia	Aug. 7	4		
Nigeria:				
Ibaden	Apr. 24-30	1		
Lagos	Apr. 29-May 5	4	1	